PIT AND QUARRY

OCTOBER 1952

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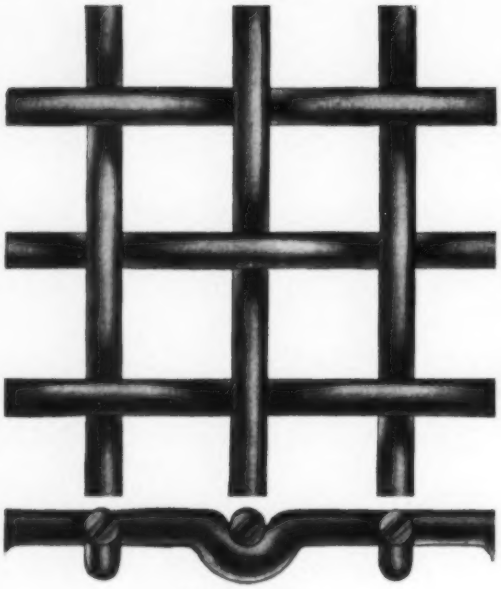
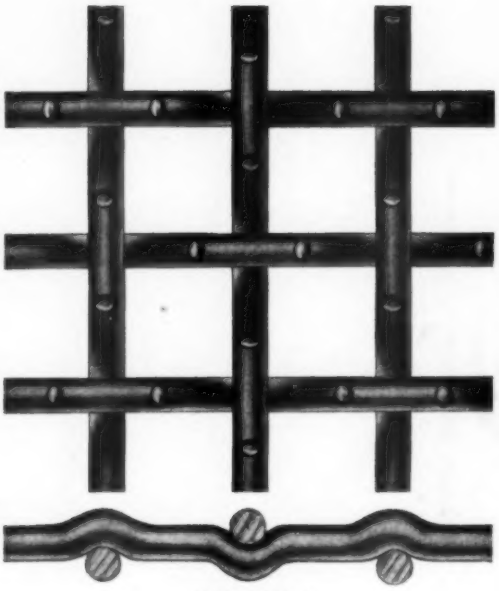


STA-SMOOTH

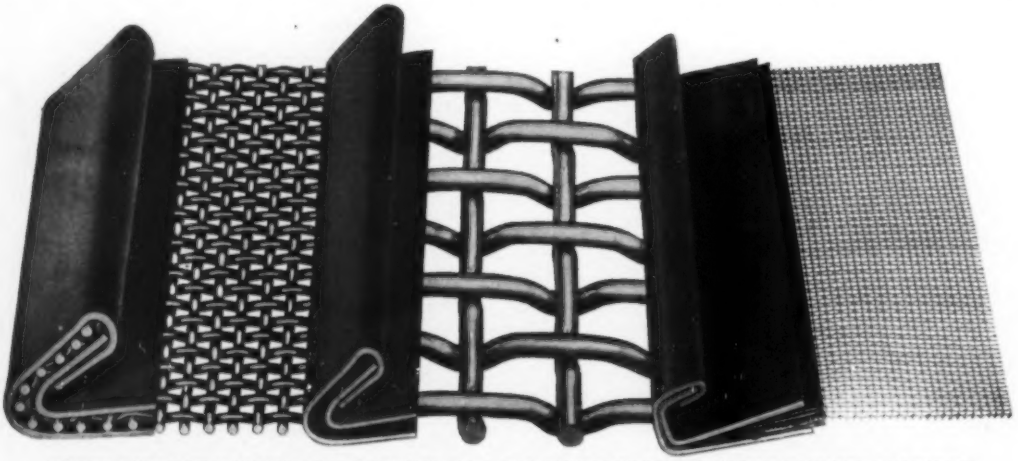


ARCH-CRIMP

SUPER-LOY VIBRATING-SCREEN SECTIONS

SUPER-HARD - - - SUPER-TOUGH - - - SUPER-STRONG

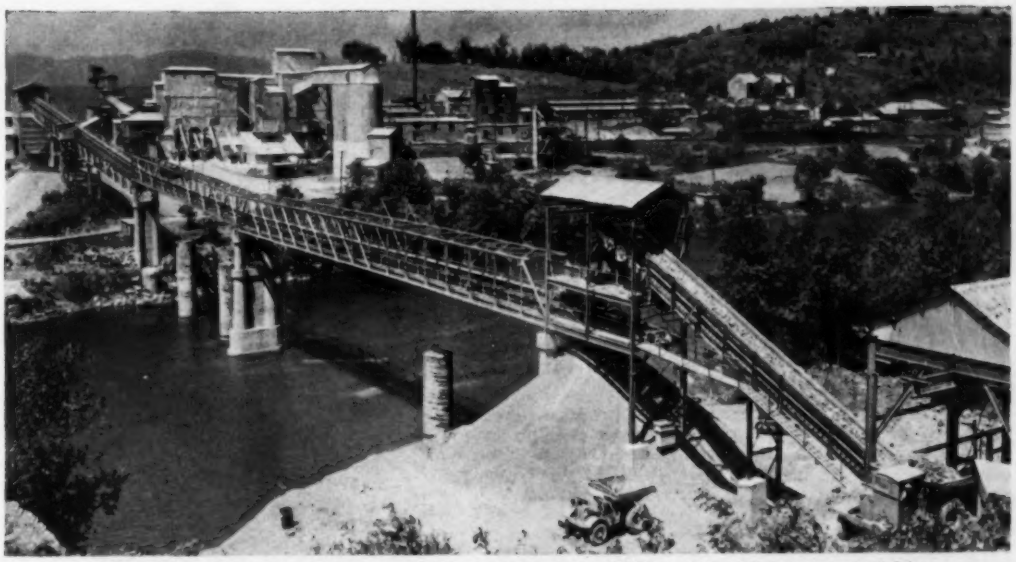
SUPER-LOY SCREENS are made from a high carbon steel specially alloyed to withstand abrasion longer — endure vibration better — resist fatigue to the utmost



ORDER LUDLOW-SAYLOR HOOK-STRIPS FOR ALL TENSIONED VIBRATING-SCREEN SECTIONS.

THE LUDLOW-SAYLOR WIRE COMPANY

634 S. Newstead Ave. **ST. LOUIS 10, MO.**



Limestone is carried across a river at a rate of 175 tons per hour on a Link-Belt 30-in. wide belt conveyor, fed by Link-Belt manganese apron feeder and steel apron conveyor on 30° incline, discharging to Link-Belt vibrating screen.

Why LINK-BELT belt conveyors are first choice in so many industries . . .

Engineering experience plus quality components combine to cut handling costs

EFFICIENCY in moving materials makes the difference between profit and loss in many operations. That's why it's so important to make sure you get the *right* belt conveyor system for your needs.

And there's no surer way of meeting your specific operating requirements than by calling in Link-Belt. Our belt conveyor specialists can efficiently engineer the system and recommend the correct components from Link-Belt's complete line of idlers, trippers and terminal machinery. And Link-Belt can match your needs in associated equipment—other types of conveyors, feeders, elevators, car dumpers and shakers.

Equally important, with such a tremendous background in belt conveyor application, Link-Belt is in an ideal position to follow through on every detail of your job—from planning through erection, if desired. One source—one responsibility.

Link-Belt will gladly work with your engineers or consultants. There's a Link-Belt office in the principal city near you.

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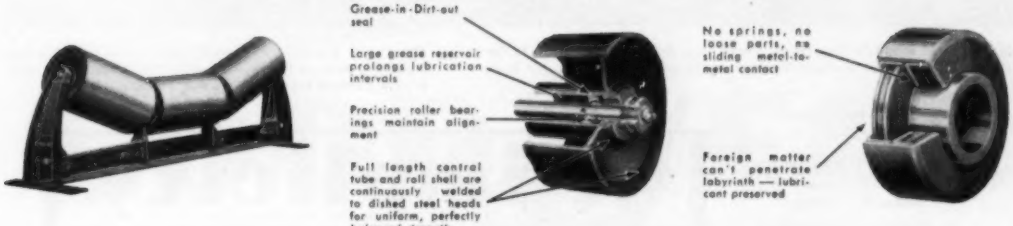
LINK-BELT

BELT CONVEYOR EQUIPMENT

LINK-BELT Roller Bearing Idlers provide free-rolling, long life


Grease-in-Dirt-out seal
Large grease reservoir prolongs lubrication intervals
Precision roller bearings maintain alignment
Full length central tube and roll shell are continuously welded to dished steel heads for uniform, perfectly balanced strength
No springs, no loose parts, no sliding metal-to-metal contact
Foreign matter can't penetrate labyrinth — lubricant preserved

Standard for Industry—L-B "100" Idler **Less lubrication and adjustment** **Grease-in-Dirt-out Seal**

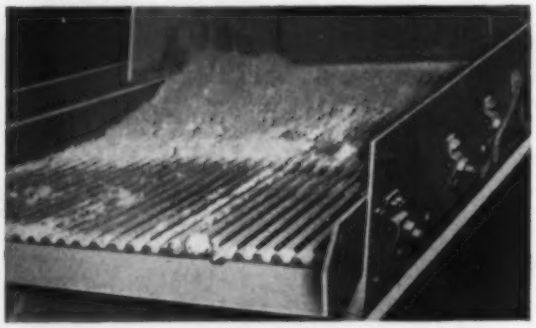
PIT AND QUARRY, October, 1952. Vol. 45. No. 4. Published monthly by the Complete Service Publishing Company, 431 S. Dearborn St., Chicago 5, Ill. Subscription price $3 for 1 year in the U. S. and possessions, Canada, Central and South America; elsewhere $3 additional for each year. Single copy 25 cents. Entered as second-class matter February 28, 1933, at the Post Office at Chicago, Ill., under the Act of March 3, 1879.

SIX SIMPLICITY UNITS SCREEN, SCALP, AND FEED ALL RAW MATERIAL AND FINISHED PRODUCT AT LIGHTWEIGHT AGGREGATE CORP. PLANT, LIVONIA, MICHIGAN

This new lightweight aggregate plant, installed by Besser Mfg. Co. of Alpena, produces from raw clay a specialized aggregate used to manufacture extremely lightweight block. Six Simplicity units help speed production and improve the quality of these block which have a high structural strength that gives maximum insulation against heat, cold, and sound.

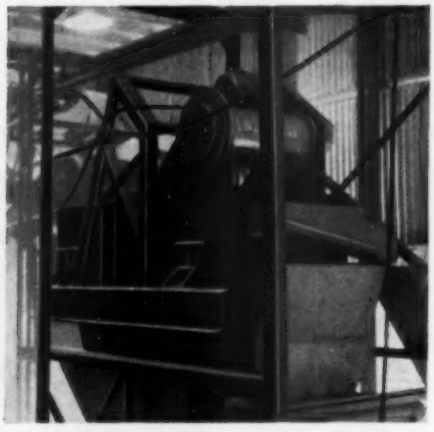
Simplicity equipment will help speed production and keep costs down in your operation, too. Write us today for complete information or consult a Simplicity sales engineer . . . there's one near you.

View of the 4' x 8' Simplicity Scalper (left) that removes 3/8" material from cinter coke discharged from the cintering machine. After cooling, the aggregate is screened to minus 5/16" sizes for the silo at the rate of 140 yards an hour on the 5' x 10' Simplicity Ball Tray Deck Screen (right). Oversize aggregate is returned to the crusher and then to a 5' x 10' Simplicity Grading Screen at the silo.



At the Lightweight Aggregate Corp. Plant, this 3' x 6' Simplicity Screen with 5/8" tubular deck takes clay from the crusher and discharges to a surge hopper on an intermittent cycle at the rate of 100 yards an hour.

The 13" x 8' Simplicity Pan Feeder shown here delivers coke breeze to the conveyor feeding the cintering machine at the rate of 10 yards per hour.



This 2' x 6' Simplicity Horizontal Screen on the coal line has a scalping deck on top. It sizes minus 1/8" coke breeze with a 13% moisture content for the Pan Feeder.

107

Sales representatives in all parts of the U. S. A.

FOR CANADA: Canadian Bridge Engineering Company, Ltd., Walkerville, Ontario

FOR EXPORT: Brown and Sites, 50 Church Street, New York 7, N. Y.

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TRADE MARK REGISTERED

ENGINEERING COMPANY • DURAND, MICHIGAN

Tough answer to a *Tough* problem

A SUPER-BRIGHT RED COVER AIR HOSE

EVEN in the most rugged hose service — direct connection to compressors in mines, quarries and construction operations — you can depend on REDWING-H Cord Air Hose for longest, trouble-free service.

That's because this hose was developed by the G.T.M. — Goodyear Technical Man — to take hard knocks in stride. Everything from its oil-resistant tube to the red cover of tough, resilient stock adds up to long life at lowest over-all cost.

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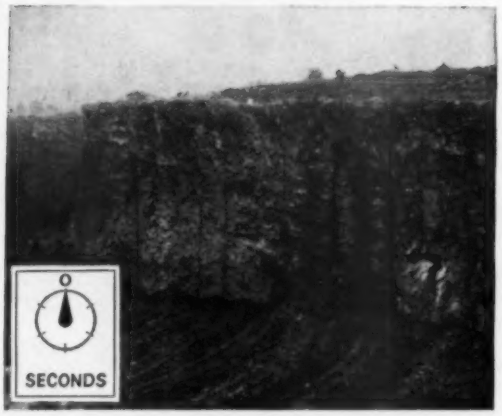
BLASTING CLUES from the ATLAS MACHINE-GUN CAMERA

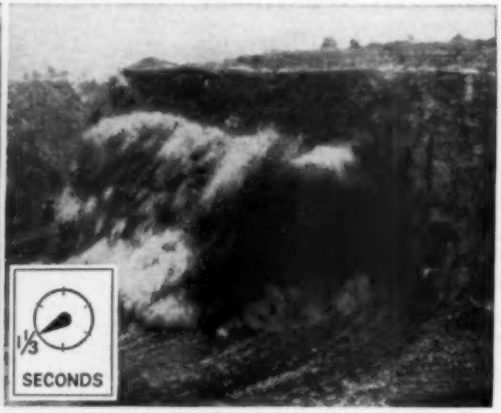
ROCKMASTER® Blast Breaks

Yes, along with the excellent confinement and efficient use of explosives energy in this 10-hole blast in a Pennsylvania cement quarry, came a muck pile just at the right height for safe, easy digging. And look at that fragmentation! Breakage like this means better loading for trucks and cars, easier crushing and more production all along the line.

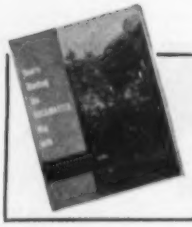


1. *Ready to shoot. Ten holes are loaded with Atlas Apex® quarry explosive.* ROCKMASTER *electric blasting caps Nos. 1 and 2 are used alternately at the bottom of holes.*

4. *Inspection will show that burden is completely broken in this photo but is just starting its downward fall. This outward movement takes whole pile away from face.*

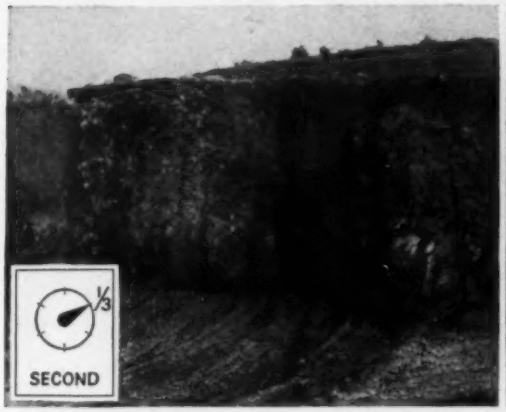


5. *First big amount of smoke and dust appears only after rock has started its fall to the quarry floor. This is far different from the "waterfall" action of ordinary blasts.*

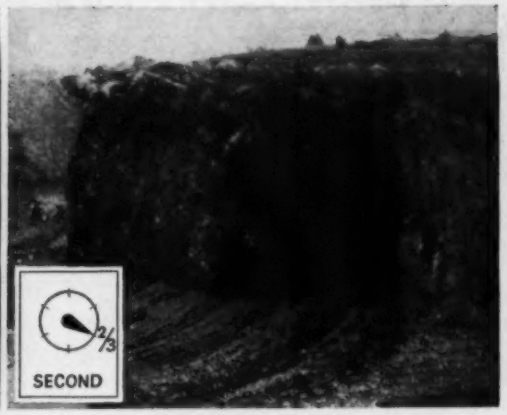


You've just seen what ROCKMASTER has done for one company. Why not see what it can do for you? Send for the new book *Quarry Blasting the* ROCKMASTER *Way* illustrating various ROCKMASTER quarry methods with machine-gun photos.

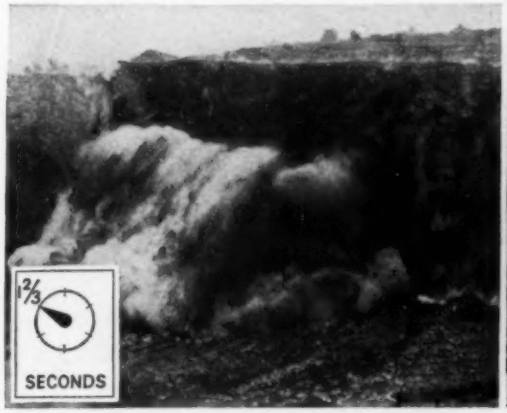
Boom-height Muck Pile From 130-foot Face



2. *One-third of a second after detonation and there are no geysers of escaping gases or air blast, but the toe is already moving forward, well ahead of the rock at the top of face.*



3. *Toe is still leading the forward movement of the rock. Camera shows that the one-two punch of the alternate* ROCKMASTER *pattern is really working through the burden.*



6. *Note there is some small top rock from between the bore holes falling down the face. This will be the only rock against the face, because bulk of burden has moved out.*

7. *Final pile clearly shows the "valley" between the crest of the muck pile and the face. The height of the pile means that the shovel can make productive cuts safely.*

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"Everything for Blasting"

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SINGLE 3240 PMCO IMPACT MASTER DOES COMPLETE CRUSHING JOB IN MODERN CLOSED CIRCUIT SETUP

Pays off with lower plant investment. High ratio of reduction eliminates secondary crushers and auxiliary equipment.

Pays off with better quality cubical product. Breaking is accomplished by rigidly mounted rotor hammers producing a high quality cubical aggregate.

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Portable 3240 Impact Master with 36" x 12' apron feeder, 30" delivery conveyor, Murphy ME6 power, 30" plant conveyor, 5' x 14' 3 deck vibrating screen, 18" return conveyor.

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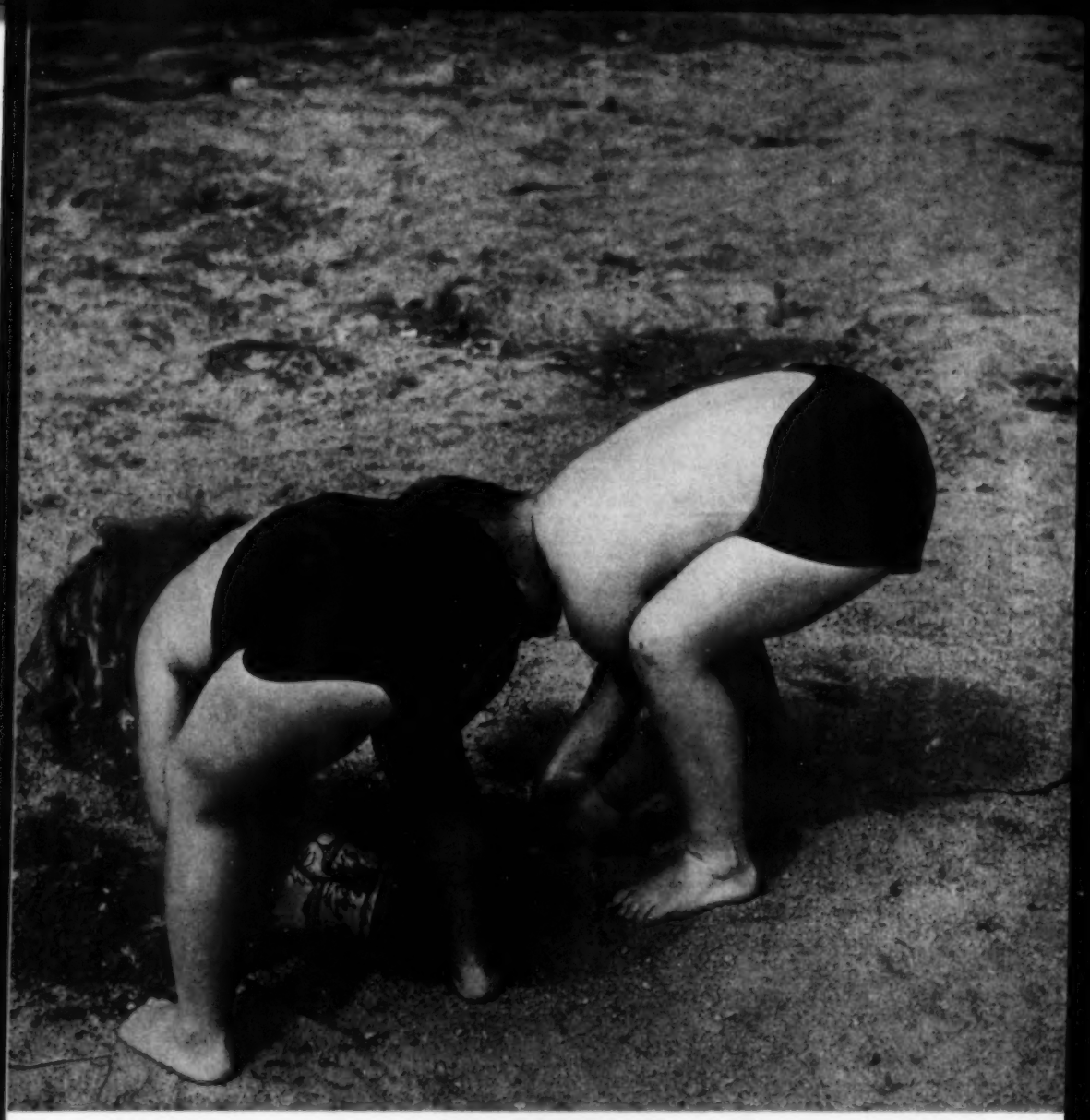

Tunnel to China

"Dig deep enough and you'll reach China."

Youngsters learn best through their own experience.

A good way, but costly.

The experience of others can be as valuable. And more economical of time, materials and motions.

Certainly this is true of packaging. Do you use or contemplate using Multiwall bags? You will find it worthwhile to draw upon the combined experience of Union's Multiwall packaging specialists. They have worked successfully with Multiwall users in hundreds of industries. Chances are they can help you.

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7 out of every 10

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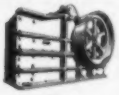
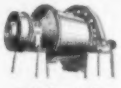

Jaw Crushers

Gyratory Crushers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There are a lot of conflicting claims about which type of anti-friction bearing is best. Actually, each type has its advantages. The problem is to decide which is best for the job at hand.

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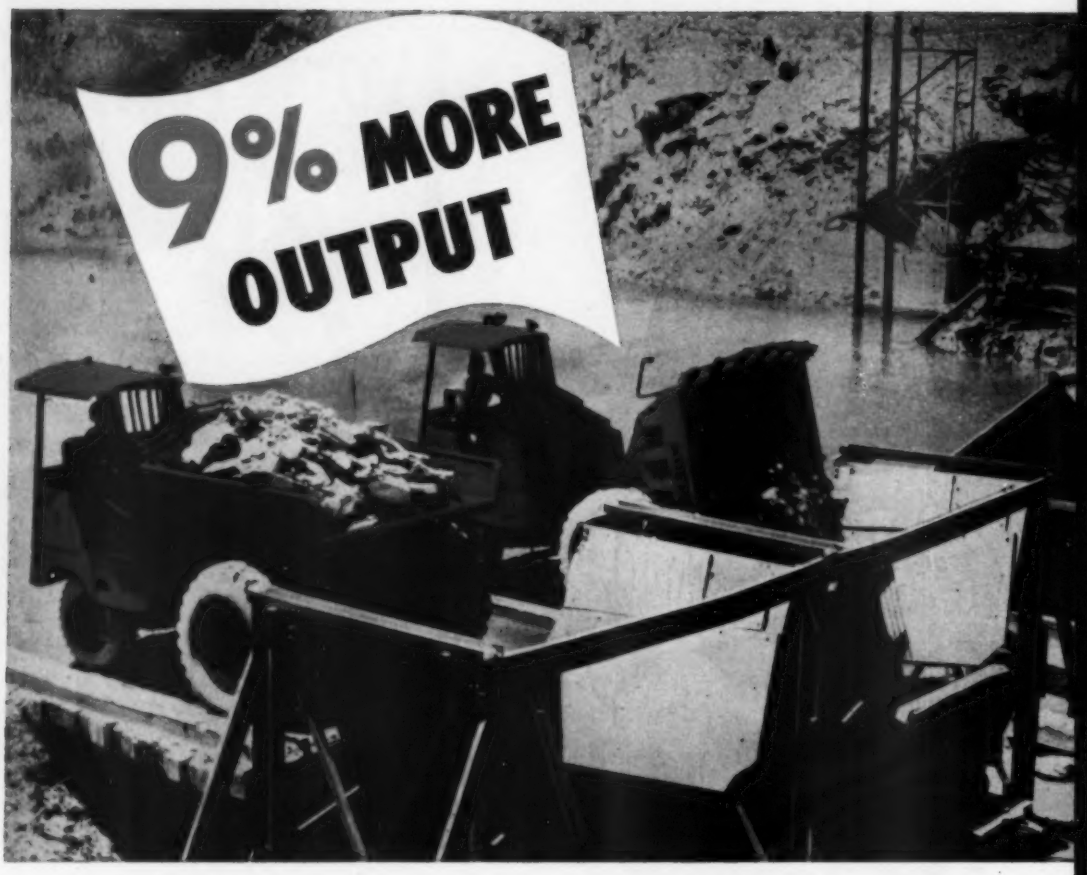

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IT takes just one second to dump a full 6-yard load with Koehring heavy-duty Dumptor. Operator trips the body release lever and gravity instantly tilts the scoop-shaped body 70° . . . one second later the body is empty, and Dumptor is on its way back for another load. Because there's no waiting for slow-acting body hoists, Dumptor saves 15 to 25 seconds every dump. This adds up to important gains in yardage output. At 16 trips per hour on a 1,000′ haul, 20 seconds dumping time saved on every cycle gains 5.3 minutes more productive haul-time . . . adds 9% to hourly yardage output.

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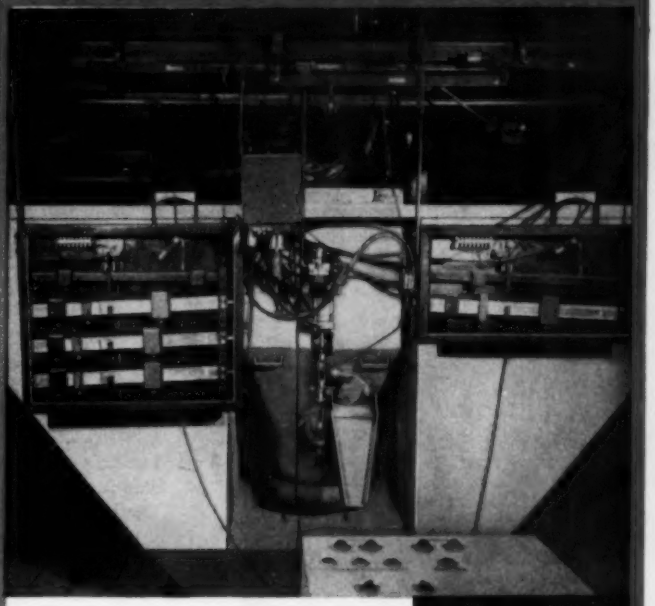
CENTRAL CEMENT FEED with Johnson Concentric Batcher



Automatic
AIR-RAM OPERATED
Finger-tip panel controls air rams on aggregate and cement fill valves and discharge openings . . . provides fully automatic operation . . . assures extreme accuracy at top batching speeds. Batcher also can be furnished with semi-automatic or manual controls.

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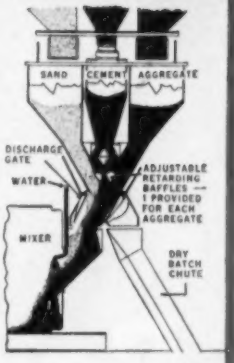
● Adjustable rate of discharge of each aggregate permits accurate ribbon-feeding . . . cement flow cuts off just ahead of final weight, prevents overshooting.

● Dual discharge is available for charging 2 stationary mixers, or 1 stationary mixer and a truck mixer or dry-batch truck.

● 2 to 5 cu. yd. sizes can be arranged for 2 to 4 aggregates, plus 1 or 2 types of cement . . . have fully-automatic, semi-automatic or manual controls. Let your Johnson distributor show you all the production advantages you will get with one of these patented Concentric Batchers in your plant.



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THIS BARBER-GREENE CONVEYOR
BEGAN SAVING MONEY
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A fantastic claim? Not at all. Every Barber-Greene Model 76 Conveyor consists of pre-engineered, standardized units. You save in these important ways:

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But it is in performance that your savings are greatest because there is no more economical method of moving material than with a Barber-Greene Standardized Conveyor. Power costs are low—maintenance is minimum—production is constant. Why not take advantage of Barber-Greene's broad experience the next time you have a material handling problem.

IF YOU MOVE MATERIALS IN YOUR BUSINESS, IT WILL PAY YOU TO INVESTIGATE BARBER-GREENE STANDARDIZED CONVEYORS.

WRITE FOR CATALOG

A catalog, completely describing Barber-Greene Pre-engineered, Standardized Conveyors, will be sent on request.

Barber-Greene

Aurora, Illinois, U. S. A.

Reynolds relies on "Cat" DW20s for big production

ON THIS operation at Alberhill, Calif., there are about 150,000 yards of overburden. It's 90 feet from the top of the hill to the clay, and the average haul is 2,300 feet round trip. Roland T. Reynolds wanted big production, so he assigned the stripping job to three "Caterpillar" DW20 Tractors with No. 20 Scrapers. And they came through for him, averaging 4,000 yards per day!

Big production is vital today, and "Caterpillar's" high-speed, high-capacity DW20 haulers have what it takes to deliver for you. Here are some fast *facts* about them:

1. They're designed and built from the ground up by one manufacturer —"Caterpillar".
2. Horsepower (225 at the flywheel) and capacity (20 yards, heaped—15 yards, struck) are *balanced* for fast loading and hauling.
3. 3-point suspension provides oscillation, roadability; eliminates frame twisting; prevents overloading of any one tire, wheel, spindle.
4. Constant mesh transmission makes shifting easy, fast, smooth.
5. Large, strong clutch prevents slippage — saves strain on operator.
6. Cable operation of No. 20 Scraper provides effective pumping of dead material.
7. Positive ejection spreads the load on the move quickly, easily.

When the going's tough, you'll find "Cat" DW20s on the job — not on the sidelines. Get full *facts* about these big yellow machines from your "Caterpillar" Dealer.

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Change to the most economical bit type as the ground changes—RIGHT ON THE JOB!

Both TIMKEN® rock bit types fit the same drill steel

YOU'LL save drilling time, cut labor costs by using interchangeable Timken® rock bits on the job. Drillers can quickly change from multi-use to carbide insert bit, *right on the job!* Both types fit the same drill steel.

Use Timken multi-use bits for ordinary ground. With correct and controlled reconditioning, they'll give you the lowest cost per foot of hole when full increments of steel can be drilled.

When you run into hard, abrasive ground, change to Timken carbide insert bits. They're the best bet for maximum speed, constant-gage holes, small diameter blast holes and very deep holes.

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Timken carbide insert bits and multi-use bits are interchangeable in each thread series. And both types of Timken rock bits give you these 3 big advantages: 1) made from electric furnace Timken fine alloy steel, 2) threads are not subject to drilling impact because of the special shoulder union developed by the Timken Company, 3) quickly and easily removable.

Call upon the 20-years' experience of our Rock Bit Engineering Service for help in selecting the best bits for *your* job. Write The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

Timken threaded multi-use rock bit

Timken threaded carbide insert rock bit

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Eimco's Cut Loading Costs on Airport Jobs

Loading Time Chart — In Minutes Per Truck Average Conditions*

MATERIAL	SIZE OF TRUCK			
	Light 2 - 4 Ton	6 Yd.	10 Yd.	15 Yd.
Sand (In Place)	.4 - .6	.6 - .8	1.0 - 1.4	1.5 - 2.0
Gravel (In Place)	.5 - .7	.6 - .9	1.0 - 1.5	1.5 - 2.3
Stockpiled Material	.4 - .7	.6 - .9	1.0 - 1.5	1.5 - 2.3
Quarry Rock (Small)	.7 - .9	1.0 - 1.3	1.7 - 2.3	2.5 - 3.3
Tunnel (Rough Bottom)		1.5 - 2.2	2.7 - 4.0	

*Quoting time from jobs where machines were factory equipped for service intended. These are actual loading time studies on a "per truck loaded" basis. Time for shifting trucks should be added.

This contractor saves on time and equipment by using his Eimco to load large heavy-duty trucks.

Loading these big 15 yard hopper type trailer trucks at the rate of 3 to 5 yards per minute — makes the trucks hustle to keep the Eimco busy.

Eimco Loaders do not have to turn to dump, they operate straight forward to dig and load, straight back to discharge. The bucket is controlled independently, may be raised or lowered, held in position at the will of the operator.

Write for more information on Eimco loaders for underground or surface jobs.

EIMCO 1406

THE EIMCO CORPORATION

The World's Largest Manufacturers of Underground Rock Loading Machines

EXECUTIVE OFFICES AND FACTORIES: SALT LAKE CITY 12, UTAH, U. S. A.

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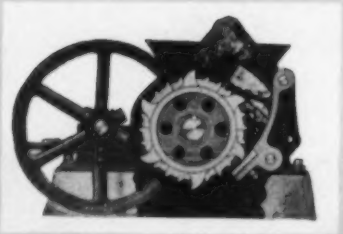
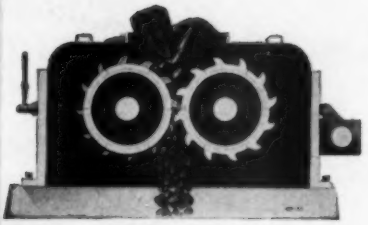
IN ENGLAND: EIMCO (GREAT BRITAIN) LTD., LEEDS 12, ENGLAND
IN ITALY: EIMCO ITALIA S.P.A., MILAN, ITALY

You can't beat an Eimco

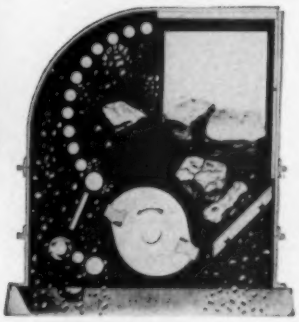


SINGLE ROLL

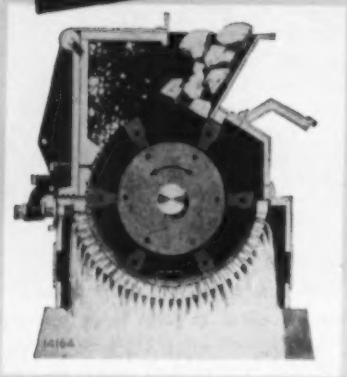


DOUBLE ROLL

CRUSHERS PULVERIZERS SHREDDERS



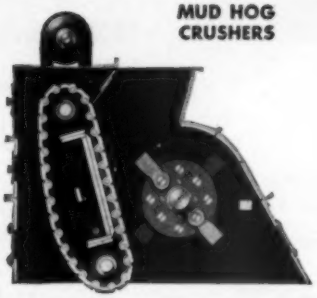
IMPACT CRUSHERS



A type and size for reducing most materials to desired size in

- Chemical Plants
- Quarries and Cement Mills
- Pulp and Paper Mills
- Power Plants
- Industrial Plants
- Mines

MUD HOG CRUSHERS



RIGID AND SWING HAMMER CRUSHERS PULVERIZERS • SHREDDERS

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HANDLE THE COMPLETE JOB IN THIS SINGLE UNIT

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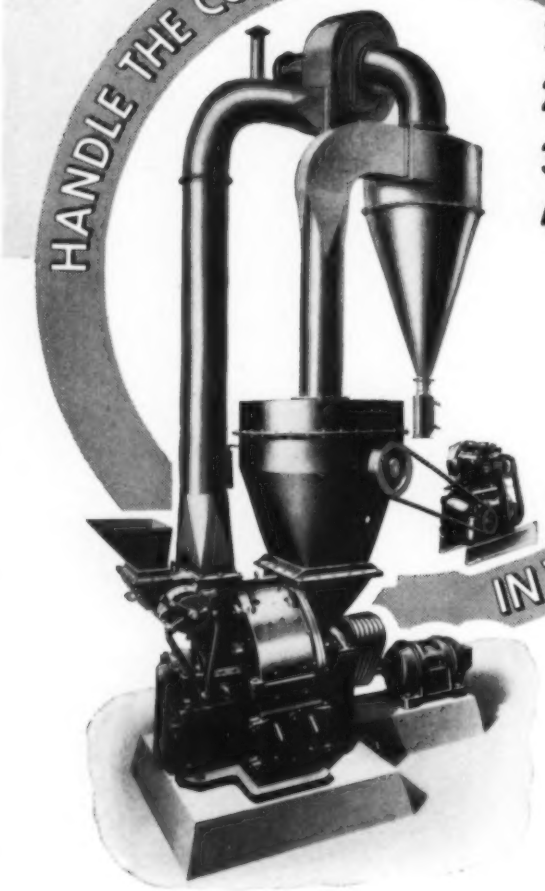
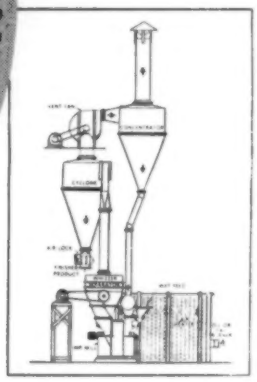
2 CLASSIFYING
3 CONVEYING
4 DRYING





Raymond
WHIZZER EQUIPPED
IMP MILL

The Raymond Imp Mill combines pulverizing, separating, conveying and drying in one complete unit. This saves costly rehandling of materials, eliminates separate units of equipment, shortens process time, and provides a clean, dustless, automatic operation.

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BLASTERS' HANDBOOK

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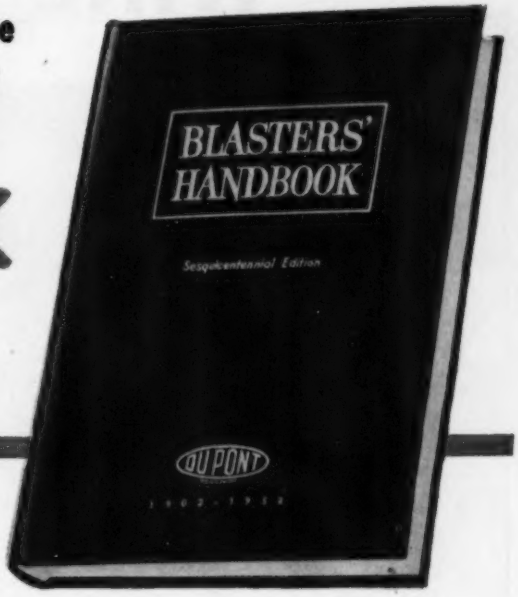

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*when you need it!**

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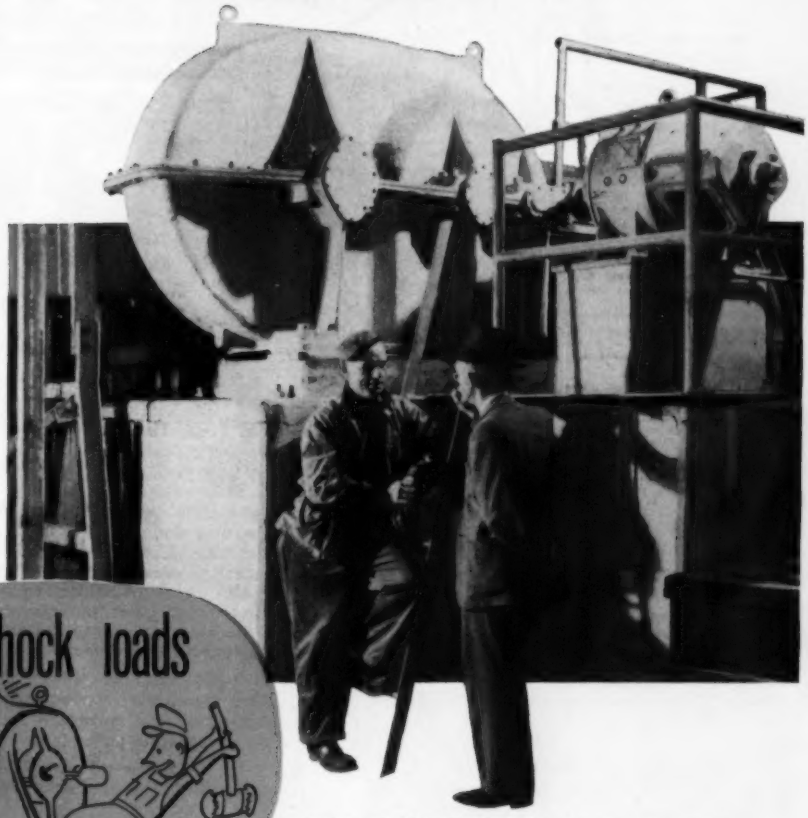

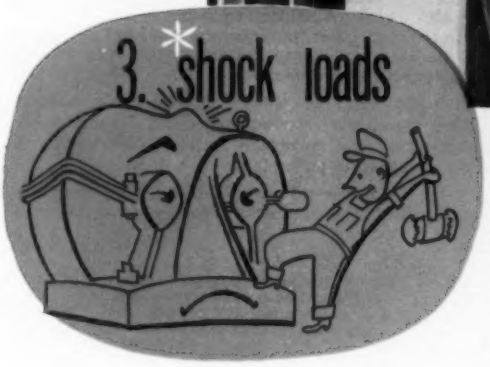

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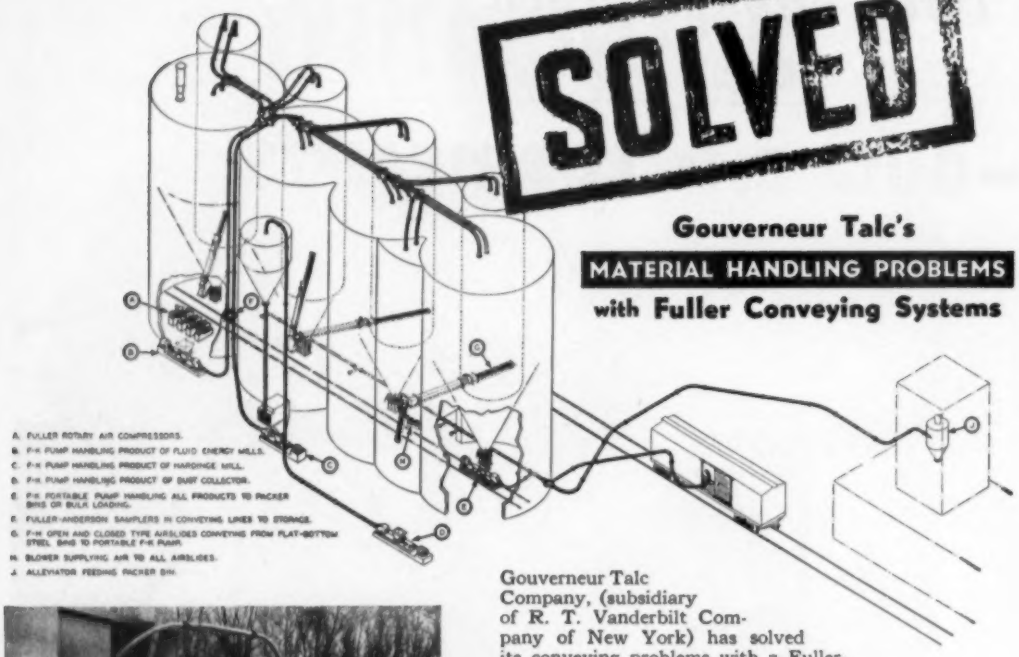
SOLVED

Gouverneur Talc's
MATERIAL HANDLING PROBLEMS
with Fuller Conveying Systems

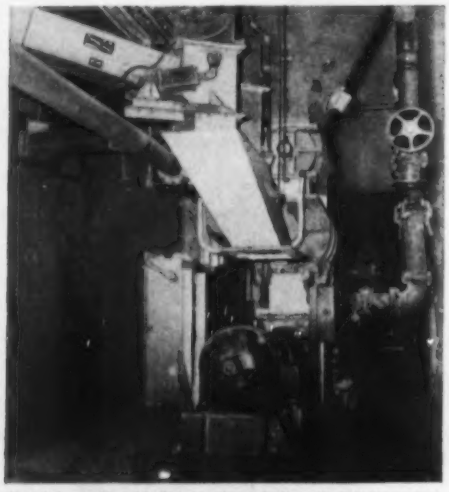

A. FULLER ROTARY AIR COMPRESSORS.
B. F-H PUMP HANDLING PRODUCT OF FLUID ENERGY MILLS.
C. F-H PUMP HANDLING PRODUCT OF HARDINGE MILL.
D. F-H PUMP HANDLING PRODUCT OF DUST COLLECTOR.
E. F-H PORTABLE PUMP HANDLING ALL PRODUCTS TO PACKER BINS OR BULK LOADING.
F. FULLER-ANDERSON SAMPLERS IN CONVEYING LINES TO STORAGE.
G. F-H OPEN AND CLOSED TYPE AIRSLIDES CONVEYING FROM FLAT-BOTTOM STEEL BINS TO PORTABLE F-H PUMP.
H. BLOWER SUPPLYING AIR TO ALL AIRSLIDES.
J. ALLEVIATOR FEEDING PACKER BIN.

Gouverneur Talc Company, (subsidiary of R. T. Vanderbilt Company of New York) has solved its conveying problems with a Fuller-Kinyon Conveying System and F-H Airslides. Three Fuller-Kinyon Stationary Pumps convey materials from pulverizers and dust collector to the storage silos and flat-bottom storage bins. One additional Fuller-Kinyon Portable Pump delivers "Nytal" talc from the silos and bins to the bulk-loading station and packer bin. Airslides, equipped with air-motor-operated cut-off gates, actuated by bin-level indicators in the packing bin, empty the flat-bottom bins directly into the portable-pump hopper.

Loading bulk talc in box car

Fuller equipment has solved Gouverneur's material handling problems conveniently and economically, reducing costs and increasing handling efficiency. It can do the same for your plant.

Ask for a free Fuller survey to determine the most economical and efficient method for handling your materials.



Fuller-Kinyon Portable Pump underneath silos. Airslide (upper left) from flat-bottom bin, for delivery to pump.

DRY MATERIAL CONVEYING SYSTEMS AND COOLERS—COMPRESSORS AND VACUUM PUMPS—FEEDERS AND ASSOCIATED EQUIPMENT

Fuller

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G-74

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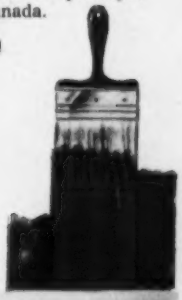

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2 Big Extra Values for you!

...in JOY SILVER STREAK ROCK DRILLS

1 EXCLUSIVE! CADMIUM PLATING INSIDE and OUT

Cadmium plating prevents rusting of JOY Silver Streak Rock Drills and spare parts while in use or in storage. In addition, the plating forms cadmium oxide under frictional heat and pressure. This so effectively acts as a lubricant that the inner parts will not score, *even if regular lubrication is temporarily neglected!* In addition to assuring a smooth "run-in," cadmium plating allows closer tolerance of precision fitting parts—vital factors in the power and long life of the drill.

2 EXCLUSIVE! JOY DUAL VALVE "Makes Air Do More Work"

The fast, powerful JOY Dual Valve action results in more and harder-hitting piston strokes per minute, for faster drilling with less air. The right amount of air is admitted behind the piston on the power stroke, and air is excluded ahead of the piston, to exert maximum force on the drill steel. Then the Dual Valve meters just enough air ahead of the piston to return it with a fast, snappy action for the next blow. The air actually does more work!

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Consult a Joy Engineer

JOY MANUFACTURING COMPANY

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Steel

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Vulnerable to Socialistic Rust!

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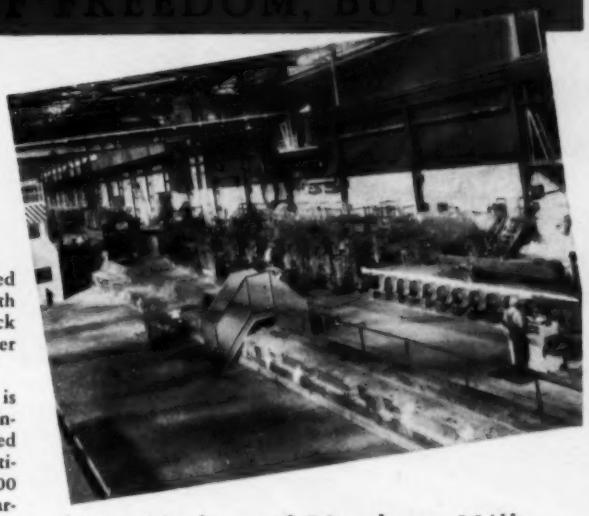
The capacity of America's steel industry is so great that in 24 hours, it can turn out ingots and castings sufficient to provide finished steel for—500 airplanes, 500 tanks, 1,000 anti-aircraft guns, a half million 3-inch shells, 1,000 howitzers, 2,000 aerial bombs, 1 aircraft carrier, 2 heavy cruisers, two cargo ships, two tankers, 1,000 freight cars, 2,000 trucks, 12,000 automobiles, 20,000 refrigerators, 20,000 stoves, 2,000 homes, and still have 23,000 tons of steel for other purposes.

Remove the incentives of free enterprise or burden it with excessive restrictions and our magnificent steel industry will be vulnerable to the wasting erosion of socialistic rust.

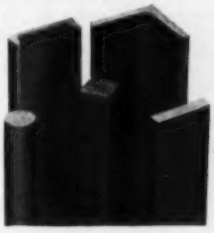
SHEFFIELD STEEL CORPORATION
HOUSTON KANSAS CITY TULSA
SUBSIDIARY OF ARMCO STEEL CORPORATION



Most Modern of Merchant Mills

On this highly mechanized 12-inch merchant mill, steel billets are more efficiently rolled into a wide variety of merchant shapes and sizes vital to manufacturing.

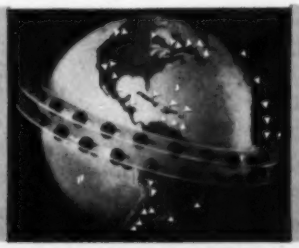
It is a typical example of the continuing modernization and expansion program of Sheffield Steel which, in the last ten years alone, has more than tripled the at-home steel making capacity of Sheffield Steel mills. New furnace and blooming mill capacity now under construction will enable Sheffield Steel to continue to pace industrial progress with an ever increasing supply of steel—the vitamin A of industrial growth.



SHEFFIELD MERCHANT STEEL

There are few industries that do not use merchant steel. Sheffield Steel mills roll a wide variety of bars and shapes.

SHEFFIELD
MOLY-COP
TRADEMARK REG.
COPPER-MOLYBDENUM-ALLOY
Grinding Balls



USED AND PROVED ALL AROUND THE WORLD

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Export Representative: ARMCO INTERNATIONAL CORPORATION • Middletown, Ohio

Telsmith Scalper and 13-B Gyratory Crusher
Telsmith Gyrasphere Crusher
Telsmith Vibro-King Sand Screen, Telsmith Super-Scrubber, Telsmith Sand Classifier

Combination GRAVEL AND QUARRY PLANT

for MAY SAND & GRAVEL CO., FORT WAYNE, IND.

ENGINEERED by TELSMITH

TELSMITH Equipment in this Plant

- 4' x 10' Single Deck Scalping Screen
- 13-B Gyratory Breaker
- 4' x 12' Double Deck Vibro-King Sand Screen
- 84" x 12' Super-Scrubber
- 30" x 25' Twin Screw Sand Classifier
- 4' x 12' Triple Deck Vibro-King Coarse Aggregate Sizing Screen
- 36-S Gyrasphere Crusher

● May Sand & Gravel Co. supplies the Fort Wayne, Indiana area with a variety of aggregate — for state highway use, ready-mix concrete, railroad ballast, etc. This versatile, flexible, combination plant with about 200 tons per hour capacity, was designed by Telsmith engineers to process a sand and gravel deposit located over a workable quarry. Three sizes of stone, and two sizes of sand can be made at the same time. Its 13-B Telsmith Gyratory Breaker and Telsmith 36-S Gyrasphere do all the crushing — now making minus 3½" plus 2", minus 1¼" plus ¼", and minus ¾" plus ¼" gravel and stone. In addition to concrete sand, either mason sand, or bituminous mix sand can be made. ● Telsmith planned plants pay profits. Get Bulletin 266.

GQ-22

SMITH ENGINEERING WORKS, 504 E. CAPITOL DRIVE, MILWAUKEE 12, WISCONSIN

Cable Address: Songworks, Milwaukee

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Practical Assistance

Whether it's a tight squeeze in a cookie jar or a bottleneck in your quarry operation . . . practical assistance—the kind that solves the problem simply and fast—is your best answer.

And ***PRACTICAL TECHNICAL ASSISTANCE*** is a *Cities Service specialty.*

Cities Service Lubrication Engineers can offer *practical assistance* that will eliminate bottlenecks caused by faulty lubrication . . . will mean dollars, man-hours and equipment saved. They're specialists in the industry's most effective lubricating practices. In addition, they offer the most complete line of Cities Service quality lubricants.

but check for yourself:

✔ Check on the high quality of all Cities Service lubricants. Ask critical users. Or better still, test them on the job.

✔ Check the complete Cities Service line for the lubricant for every need. Deliveries are quick—and dependable.

✔ And finally, discuss your problems with a Cities Service Lubrication Engineer . . . he's probably solved many like them for other quarry operations. Write or phone CITIES SERVICE OIL COMPANY, Dept. J-21, Sixty Wall Tower, New York City 5 . . . or get in touch with the office nearest you.

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On saved shifting time alone

YOU CAN GAIN UP TO 25

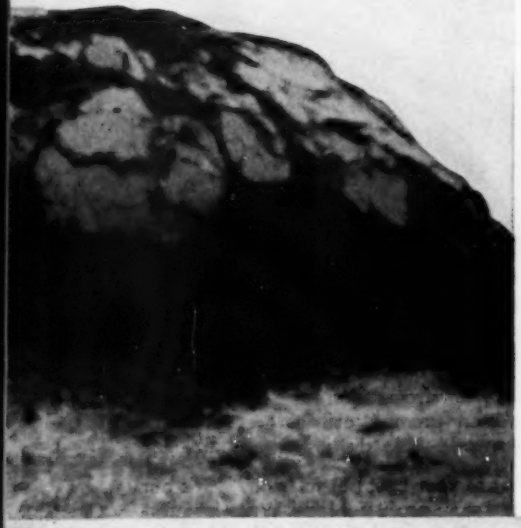
THE NEWEST, FINEST LINE ON EARTH!

HD-5	HD-9	HD-15	HD-20
40 drawbar hp., 11,250 lb.	72 drawbar hp., 18,800 lb.	109 drawbar hp., 27,850 lb.	Hydraulic Torque Converter Drive, 175 net engine hp., 41,000 lb.

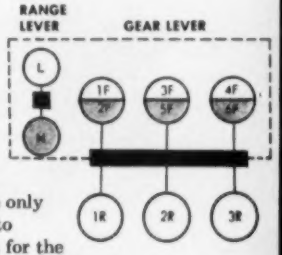
PERCENT MORE PRODUCTION

WITH THE MODERN SHIFT PATTERN ON ALLIS-CHALMERS HD-9 AND HD-15 TRACTORS

It takes just half the time and effort to change from low forward to fast reverse with the Allis-Chalmers HD-9 and HD-15 transmission. This shifting time saved becomes production time gained on bulldozing and other jobs calling for a short forward-backward cycle. For example, job studies prove that on backfilling, pusher work, working around large excavators, digging and loading with front-end shovels—other jobs where frequent shifts are required—you can make five passes in the time usually required to make four...actually increase production up to 25 percent.



Here's how it works



You go from any forward to any reverse speed with one simple shift of the gear lever. The only time you touch the range lever is to select the forward range you want for the job to be done—just set it and forget it.

The constant-mesh Allis-Chalmers transmission makes shifting smooth and effortless...without gear clashing. And it's so easy that the operator can *always* take advantage of high-speed reverse.

This exclusive shift pattern, together with all-steel welded construction, unit assembly, 1,000-hour lubrication, are just a few of the reasons you get more work done with the new *designed-for-your-job* Allis-Chalmers tractors.

ALLIS-CHALMERS

TRACTOR DIVISION • MILWAUKEE 1, U. S. A.

"EUCS" Are Your Best Bet!

Because of their rugged construction and dependable performance, Rear-Dump Euclids are standard equipment on hundreds of mine, quarry, and construction jobs. For moving rock, ore, overburden and other heavy excavation, "Eucs" have the capacity and speed to haul bigger loads faster and at lower cost per ton or yard moved.

Look at the record! Of the thousands built, nine out of eleven Euclids are still in use today! They're job proved... have earned their reputation for staying power, low-cost production and efficient operation on a wide range of work.

Owners know from experience that they can depend on prompt, efficient service from Euclid's world-wide distributor organization.

Euclids are your best bet for more loads per hour and more profit per load. Write for information on the complete line of Euclid equipment, or call your Euclid Distributor today.

The EUCLID ROAD MACHINERY Co., CLEVELAND 17, OHIO

95% of your tonnage can now be handled with machines completely lubricated by just 3 Shell products*

*SHELL RETINAX A GREASE

. . . a superior new multi-purpose grease for all types of heavy-duty automotive vehicles. It does the job of four or more specialized greases—yet only one gun is required.

Recommended for chassis (all points), wheel bearings, universal joints, and water pumps, Shell Retinax A gives you better protection against wear and washing out.

*SHELL SPIRAX EP††

. . . an exceptional "alloy type," Extreme Pressure gear oil. Shell Spirax EP is recommended for rear axles of the hypoid, spiral bevel, and spur gear types, as well as for heavy duty transmissions. It is extremely stable . . . has long-lasting anti-rust and film strength properties. Results: longer gear life, lower maintenance costs.

*SHELL ROTELLA OIL

. . . for all engine lubrication, Shell Rotella Oil is a new, fortified, extra-heavy-duty lubricant which has set new standards of performance in high speed diesel and heavy-duty gasoline engines.

By maintaining clean engines and minimizing sludge formation, piston lacquering, ring and valve sticking, and port clogging, Shell Rotella Oil extends periods between overhauls, reduces parts replacement costs, and gives you reduced oil consumption.

††Some manufacturers recommend a straight mineral oil for gear lubrication. Your Shell Lubrication Engineer will suggest the proper lubricant in such cases.

SHELL "3-BARREL" LUBRICATION

SHELL OIL COMPANY,
50 West 50th Street, New York 20, N. Y.
100 Bush Street, San Francisco 6, Cal.

Please send me literature describing the 3-Barrel plan of lubrication.

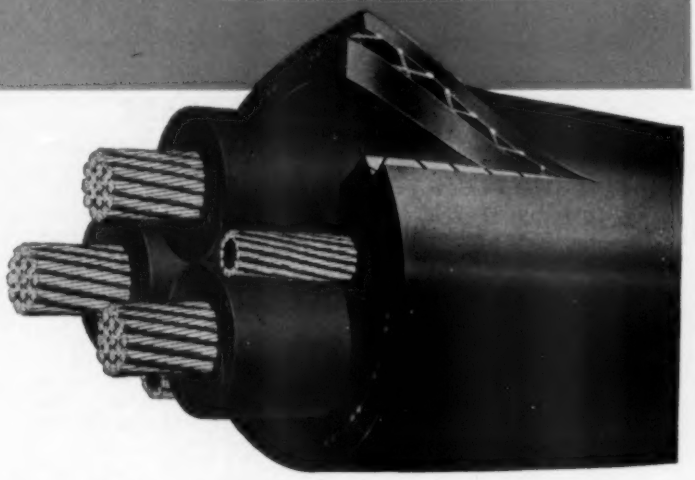
Name_____

Company_____

Address_____

Here's your mine cable insulated with COLD RUBBER

Another big improvement in Securityflex 600-V Mine Cable



*Cold rubber is firmer and tougher and less permeable. It gives this new and better Type G Securityflex**

much more moisture resistance
much more compression resistance
much more cut resistance

That means longer cable life, fewer power interruptions, less maintenance trouble, *much more value for your money.*

Also—the famous Anaconda patented rubber-cored grounding wires are non-kinking and cushioned in a larger diameter that won't cut insulation.

This means far more dependable and efficient grounding. When the cable twists in service the grounding wires are protected. Every wire in every strand is firmly supported and cushioned. There'll be fewer failures, fewer splices, less production loss, less expense.

Investigate this cable. See it. Call your nearest Anaconda Sales Office or Anaconda Distributor. Anaconda Wire & Cable Company, 25 Broadway, New York 4, New York.

*Trademark

the right cable for the job **ANACONDA®**
WIRE AND CABLE

Amscoating

The Right Way to Say Hard-facing for every Industrial Use

AMSCO TOOLFACE for metal to metal wear up to 1000° F. Deposits have high abrasion and impact resistance. All diameters bare and coated. Microstructure: martensitic steel.

AMSCO TUBE TUNGSITE (coarse particles) is best suited for applications requiring highly efficient cutting qualities, for hardfacing earth working and drilling equipment used for cutting extremely hard compositions, for hardfacing applications requiring a serrated edge and hard-facing certain types of earth working equipment or parts subject to extreme abrasion.

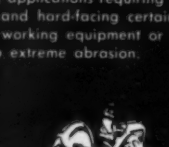
AMSCO HF-60 for moderate impact and abrasion and has outstanding weldability particularly for vertical applications. All diameters, coated only. Microstructure: martensitic steel.

AMSCO FARMFACE or AMSCO CHROMEFACE for farm or industrial use. Excellent resistance to low stress sliding abrasion. All diameters, bare and coated. Microstructure: a high chromium austentitic iron containing manganese and silicon, and consisting of hard chromium carbides in a matrix of austenite.

AMSCO No. 217 for abrasive service up to 1000 F. All diameters, bare and coated. Microstructure: an air hardening martensitic iron alloy containing chromium and tungsten.

AMSCO HF-40 for severe abrasion, moderate impact. Deposits have excellent weldability. All diameters, coated only. Microstructure: martensitic cast iron.

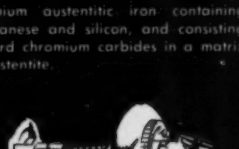
AMSCO AIR-HARDENING for abrasion and severe impact. Deposit can be forged to sharp edge without loss of hardness. All diameters, bare and coated. Microstructure: martensitic steel.



AMSCO AW-79 will meet most requirements for better control of wear where abrasion and impact are important factors—plus all the advantages of automatic welding. Especially suitable for rebuilding and hardfacing tractor rollers, steel wheels, sheeting rolls, dredge pins, as well as dozens of other automatic applications. 5/32" and 3/16" in 22½" ID., 100 lb. coils.

AMSCO V-MANG, bare or coated, for build up and repair on manganese steel castings exposed to impact; work hardens—1/32", 1/16", 1/4". Microstructure: austenitic manganese steel.

AMSCO CO-MANG, coated only, for build up and repair of manganese steel castings exposed to severe impact. Deposit has excellent impact resistance; work hardens—1/8", 5/32", 3/16", 1/4". Microstructure: austenitic manganese steel.



AMSCO TUNGROD (fine particles) is best suited for applications requiring highly efficient cutting qualities, for hardfacing earth working and drilling equipment used for cutting extremely hard surfaces or formations, for hardfacing applications requiring a thin edge or small point, for hardfacing certain types of equipment or parts subject to extreme abrasion.

AMSCO ECONOMY HARDFACE "C" for abrasion resistant service and severe impact. All diameters, coated only. Microstructure: martensitic steel.

AMSCO No. 1 and AMSCO No. 6 for combination of corrosion and abrasion or for 1000 F. service and above. No. 1 has greater abrasion resistance; No. 6 is tougher and can be machined. All diameters, bare and coated. Microstructures: No. 6 contains an eutectic carbide mixture in a solid solution matrix, while No. 1 contains large hard wear-resistant chromium carbide crystals scattered through a solid solution matrix.

AMSCO No. 459 for severe abrasion, mild impact. Excellent abrasion resistance. All diameters, bare and coated. Microstructure: martensitic cast iron containing chromium and molydenum, consisting of hard carbides, austentite and martensite.

To get the right answer, detailed analyses, and other pertinent information, concerning your wear problem, write for catalog 650W or contact your nearest Amsco Distributor.

AMERICAN Brake Shoe COMPANY

AMERICAN MANGANESE STEEL DIVISION

396 EAST 14th STREET · CHICAGO HEIGHTS, ILL.

Other Plants: New Castle, Del., Denver, Oakland, Cal., Los Angeles, St. Louis. In Canada: Joliette Steel Division, Joliette, Que. Amsco Welding Products distributed in Canada by Canadian Liquid Air Co., Ltd.

Let's be practical about precipitators

A Koppers-Elex electrostatic precipitator like this one (shown on a cement dust application) can be your best investment in nuisance abatement. Inherent efficiency of the design is high enough to meet all present and proposed nuisance abatement requirements . . .

Here's what you can do *today* to meet more stringent nuisance abatement laws of the *future!*

IT'S ALMOST a foregone conclusion that nuisance abatement laws all over the country are going to be tightened up. That's one big reason why you should specify Koppers-Elex electrostatic precipitators. Koppers has proved designs right now which clean process gases down to .15 grain per cubic foot residual and less! And that performance is well within most existing or contemplated nuisance abatement requirements.

Re-entrainment, the big problem in nuisance abatement, is held to an absolute minimum because rapping is sectionalized. Successive collection zones are separately energized to provide highest voltage in each field for maximum cleaning. You may specify either conventional storage type hoppers or Koppers *unique bottom drag scraper* which gives you continuous dust feed!

Hundreds of Elex precipitators have been installed in plants all over the world. Koppers-Elex precipitators include "packaged" mechanical or vacuum tube power packs which can be installed in any convenient area in the plant. This means that these electrostatic precipitators are more compact, easier to install around existing facilities.

PERFORMANCE GUARANTEED!

Koppers engineers protect your investment in an electrostatic precipitator by guaranteeing both the recovery or gas-cleaning efficiency and the residual content left in the gas after cleaning. Koppers-Elex electrostatic precipitators are designed, engineered, fabricated, erected and guaranteed under one contract by Koppers Company, Inc.

IF YOU HAVE A GAS-CLEANING PROBLEM, write today and outline the details for us to review. There is no obligation. Just address your letter to: KOPPERS COMPANY, INC., *Precipitator Dept.*, 380 Scott Street, Baltimore 3, Maryland.

KOPPERS ® *Koppers-Elex* ELECTROSTATIC PRECIPITATORS

in WIRE ROPE, too, extra strength demands the RIGHT KIND of muscle

Towering as high as eight feet on his hind legs, the Kodiak or Alaskan Brown Bear ranks as the most powerful animal of North America. Rugged muscle development makes him the feared and deadly fighter that he is.

In wire rope, too, the right kind of muscle is essential to ward off the destructive effects of abrasion, corrosion, bending fatigue, load strain and shock stress.

That's why in Wickwire Rope we make sure—through complete quality control—that you always get the right construction and lay of the rope...the right grade of steel and size of wire for long-lasting resistance to the rigors of your particular service.

See your Wickwire Rope distributor or contact our nearest sales office.

THE COLORADO FUEL AND IRON CORPORATION—Abilene (Tex.) • Denver • Houston • Odessa (Tex.) • Phoenix • Salt Lake City • Tulsa
THE CALIFORNIA WIRE CLOTH CORPORATION—Los Angeles • Oakland • Portland • San Francisco • Seattle • Spokane
WICKWIRE SPENCER STEEL DIVISION—Boston • Buffalo • Chattanooga • Chicago • Detroit • Emlenton (Pa.) • New York • Philadelphia

WICKWIRE ROPE
A CF&I PRODUCT

1282

A YELLOW TRIANGLE ON THE REEL IDENTIFIES WICKWIRE ROPE

WICKWIRE ROPE

CF&I

PRODUCT OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL AND IRON CORPORATION

Walks away with tough payloads!

Pile on a capacity payload. Then watch a big, rugged International walk away with it!

The International for you is built to stand up through your toughest jobs, at less operating and maintenance cost. It's the result of the same engineering that has kept International the heavy-duty leader for 20 straight years.

That means you can expect consistently high performance and longer truck life plus greater comfort and easier handling.

There's more to tell, so why not see your International Dealer or Branch soon, and start saving money?

INTERNATIONAL HARVESTER COMPANY • CHICAGO

Look for these International exclusives:

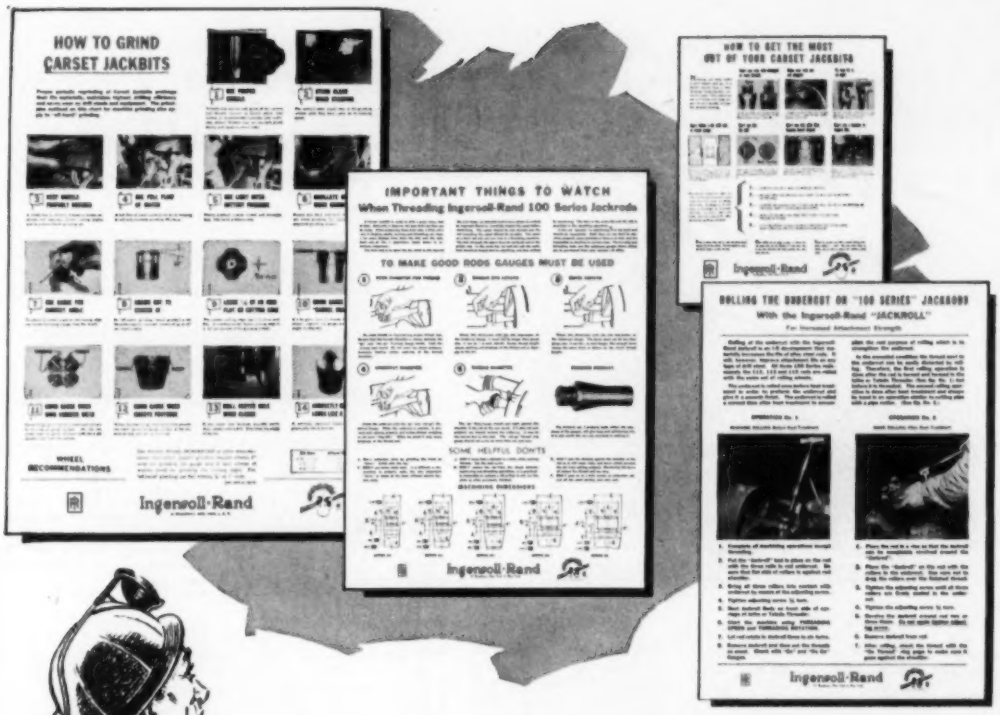
- Powerful, dependable, economical gasoline, diesel or LPG power plants for rough, tough going.
- The "roomiest, most comfortable cab on the road"—the Comfo-Vision Cab. One-piece full vision windshield. New green tinted "Solex Duplate" glass available.
- Super-steering system — more positive control, easier handling and 37° turning angle.
- Extra heavy-duty engineered for your job, selected from the world's most complete line. 115 basic models, from ½-ton pickups to 70,000 lbs. GVW off-highway models.
- More than half the International Trucks ever built are still on the job.
- America's largest exclusive truck service organization.

International Harvester Builds McCormick Farm Equipment and Farmall Tractors
Motor Trucks . . . Industrial Power . . . Refrigerators and Freezers

Better Roads mean a better America

INTERNATIONAL TRUCKS

"Standard of the Highway"


HOW TO GRIND CARSET JACKBITS
Ingersoll-Rand
IMPORTANT THINGS TO WATCH
When Threading Ingersoll-Rand 100 Series Jackrods
TO MAKE GOOD RODS GAUGES MUST BE USED
SOME HELPFUL DON'TS
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HOW TO GET THE MOST OUT OF YOUR CARSET JACKBITS
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Get more* out of your CARSET JACKBITS by using these *free* WALL CHARTS

** To get maximum drilling speed and longest bit life you should use Ingersoll-Rand Carset Jackbits as indicated on these charts.*

■ Nothing will make a shift easier or help you get in a better round quicker than fast-drilling Carset Jackbits. To help you make sure that your Carset Jackbits are used to best advantage, Ingersoll-Rand has prepared these four large, easily read charts for your bit-shop wall or bulletin board. They give simple illustrated directions for using and servicing Carset Jackbits and threading 100 Series Jackrods.

You'll find these charts a big help in showing your drilling crews and shop personnel how to get the most out of longer-lasting, faster-drilling Ingersoll-Rand Carset Jackbits. To get your free copies, call your nearest Carset Jackbit supplier or fill out and return the coupon.

Ingersoll-Rand 7B5-18
Rock Drill Dept., 11 Broadway, New York 4, N. Y.

Please send me, free of charge, the wall charts checked below:

- ☐ Grinding Carset Jackbits, Form 4121
- ☐ Using Carset Jackbits, Form 4122
- ☐ Threading Jackrods, Form 4112
- ☐ Rolling the Undercut, Form 4120

Name _____
Company _____
Address _____
City _____

YEARS-AHEAD ENGINEERING...

NEW GYRATORY CRUSHER WITH DOUBLE DISCHARGE OUTLETS

World's Largest Manufacturers of Crushing, Mining and Cement Machinery

For over a half-century, KVS has pioneered and developed many of the most important methods and machines used for crushing, mining and the manufacture of Cement and Lime.

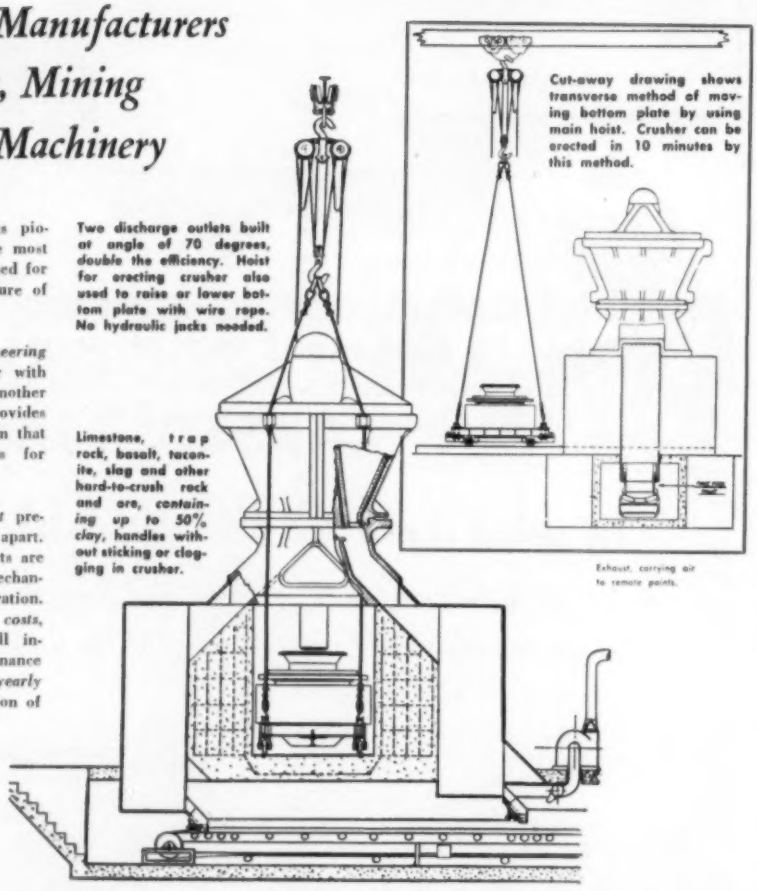
Typical of this "Years-Ahead" engineering is the new KVS gyratory Crusher with double discharge outlets. It's another Kennedy "first" in design and provides the answer to the sticky ore problem that has baffled crusher manufacturers for years.

All KVS machinery and equipment presents exclusive features that set them apart. In use the world over, these products are noted for their individual design, mechanical excellence and economical operation. *In these days of high production costs,* machinery and equipment that will increase *daily* output, reduce maintenance costs, and at the same time, increase *yearly* profits, merits the serious consideration of every operating company.

There's a piece of KVS machinery and equipment that will help your plant to operate more efficiently and profitably.

Two discharge outlets built at angle of 70 degrees, *double* the efficiency. Hoist for erecting crusher also used to raise or lower bottom plate with wire rope. No hydraulic jacks needed.

Limestone, trap rock, basalt, taconite, slag and other hard-to-crush rock and ore, *containing up to 50% clay,* handles without sticking or clogging in crusher.



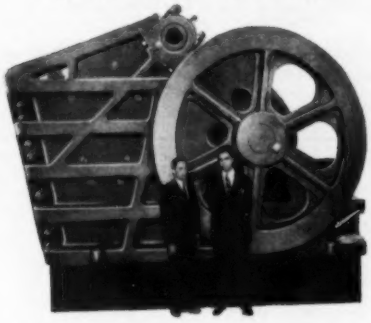
Cut-away drawing shows transverse method of moving bottom plate by using main hoist. Crusher can be erected in 10 minutes by this method.

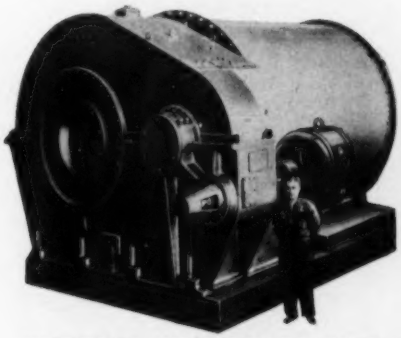
Exhaust, carrying air to remote points.

SEND FOR BULLETIN DESCRIBING ALL KVS MACHINES

ASSURES CONTINUED LEADERSHIP

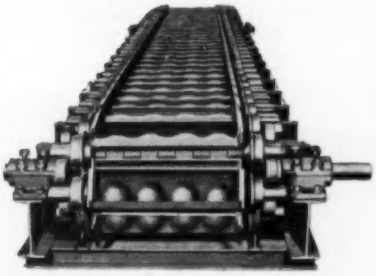
SWING JAW CRUSHER

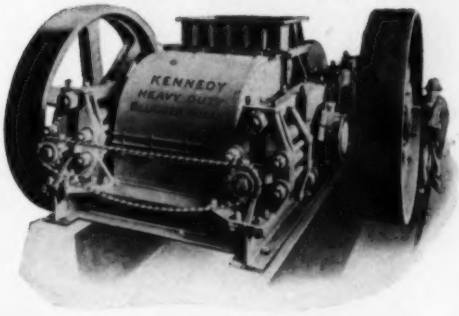




HEAVY-DUTY ROCK FEEDER

INTEGRAL GEAR DRIVEN MILL





HEAVY-DUTY
SLUGGER ROLL

ROTARY KILN

IT COSTS LESS.. TO OWN THE BEST!

KENNEDY - VAN SAUN

MANUFACTURING & ENGINEERING CORPORATION

TWO PARK AVENUE, NEW YORK

FACTORY DANVILLE, PA.

Here's Efficiency ... right

Kennedy Rotary Kilns...Engineered and of Cement ... at Production Costs

Rotary Kilns, engineered by KVS produce uniform quality and maximum quantities of cement at LOWEST operating costs! Service records and case histories, gathered on KVS installations all over the world, prove our methods are

KENNEDY ROTARY RIDING RINGS FORGED IN THE KVS FOUNDRY

Outside diameter,	**11' x 11"**
Thickness,	**8"**
Face width,	**22"**
Weight,	**22,600 lbs.**

Riding ring illustrated is forged, ready for machining.

All materials **used in the construction of KVS equipment is specially selected and tested chemically and physically to determine unvarying standards of strength and durability.**

Foundry facilities **permit pours up to 90,000 lbs., indicative of KVS ability to handle castings and forgings of large size.**

KVS have available bulletins describing their rotary kilns and equipment. Send for this data.

out where you can see it!

Built to Produce Maximum Quantities that Defy Competition . . . . . .

without a peer from any standpoint of performance or maintenance.

As an integral part of a modern cement plant, KVS kilns, built section by section, provide unrivaled facilities for the scientific and systematic production of fine quality cement required of a rotary kiln. Firing hood, control panel, riding rings, supporting rollers, gears and rotary kiln drives are engineered to operate year-in, year-out, with an absolute minimum of wear or time lost for repairs and maintenance.

Let our engineering department show you flow charts of KVS plants which are delivering record totals of products at consistently LOW COST PER TON. KVS materials are normalized and subjected to continuous chemical and physical tests to insure a high degree of strength and durability. Add to this, KVS unmatched engineering skill and you'll see why users say: "It Costs Less to Own the Best."

FIRING HOOD OF ROTARY KILN

With Special KVS Flange Extension for Air Seal Between Hood and Kiln Shell

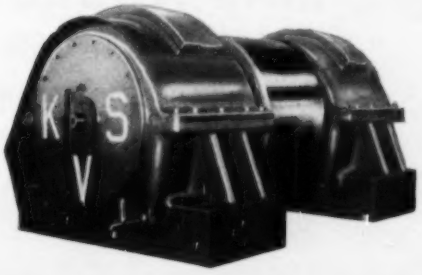
Built to rigid specifications, KVS Firing Hoods are carefully fitted to kiln shells to conserve heat. *Other special KVS features* are mounting on four car wheels for ease of moving; entrance door, large enough for a man to enter, for inspection of interior or repair of fire brick. Peep holes and barring holes are provided. Heavy, welded construction assures lasting service.

KENNEDY RIDING RING SUPPORTING ROLLERS

Internally Water Cooled . . . Mounted on Self-Aligning Bearings

Made of open hearth cast steel with shaft cast integral, sturdy, strong, built to carry heavy-duty riding rings smoothly.

Lubrication by automatic ferris wheel type system with lower bearing forming an oil reservoir holding lubricant. Bearing is completely equipped with oil and dust-tight seal; asbestos guards protect against radiation from kiln shell.



IT COSTS LESS.. TO OWN THE BEST!

KENNEDY-VAN SAUN

MANUFACTURING & ENGINEERING CORPORATION

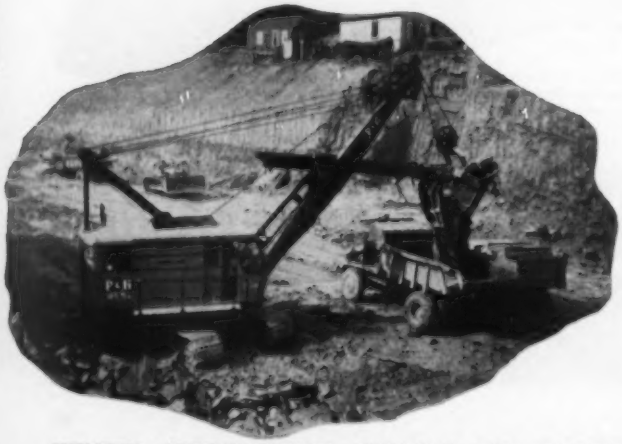
TWO PARK AVENUE, NEW YORK

FACTORY DANVILLE, PA.

AND READY FOR ANY JOB

P&H MAGNETORQUE* Electric

Swing is 15% to 25% faster than any 2½ yd. shovel



If it's husky strength you want, this is it! Tough all-welded construction throughout to take pounding and shock loads that would K.O. less rugged machines. It means steady digging — less maintenance — down through the years.

If it's speed, you have it Magnetorque — speed to out-produce any other machine in the 2½ yd. class — with a swing that's 15% to 25% faster. It's the greatest shovel improvement in 20 years. We'll gladly tell you where to see the 955-A working nearest you. Ask today!

If you want larger capacity, ask for facts about the Model 1055 (3½ yd.).

*T.M. of Harnischfeger Corporation for electro-magnetic type clutch.

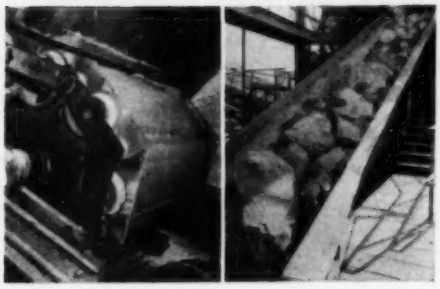
P&H POWER SHOVELS & CRANES

HARNISCHFEGER
CORPORATION

4400 W. National Avenue • Milwaukee 46, Wisconsin

POWER SHOVELS • CRAWLER AND TRUCK CRANES • OVERHEAD CRANES • HOISTS • ARC WELDERS AND ELECTRODES • SOIL STABILIZERS • DIESEL ENGINES • PRE-FABRICATED HOMES

It pays to choose a feeder that fits your operating requirements

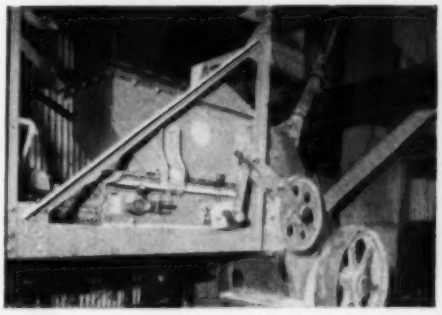


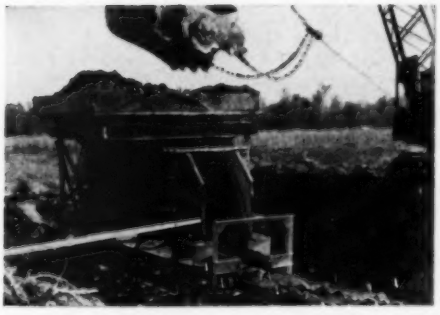
FOR HEAVY IMPACT SERVICE

Where material consisting of heavy, sharp or abrasive large lumps must be handled, Link-Belt Heavy Duty Apron Feeders are the answer. Severe service—including high temperature and heavy impact—causes no trouble for these rugged feeders. Four designs meet varying operating needs. Widths from 18 to 60 in.

FOR ACCURATE FEEDING

The Link-Belt Apron Feeder at right provides a uniform flow for smaller tonnages. Relatively short pitch chains and apron pans are employed. The drive is arranged to provide easy adjustment of feed to the crusher, permitting great flexibility to meet varying operating conditions.





FOR SMOOTH, UNIFORM FLOW

Smooth operation and uniform discharge are assured with Link-Belt Belt Feeders. Free-rolling roller bearing idlers require less lubrication and adjustment. Adjustable skirting provides seal to prevent leakage. Recommended for all materials except those that are hot, fluffy or exceptionally large lump. Belt widths from 18 to 48 in.

LINK-BELT makes a complete feeder line . . . offers the right one for your requirements

In addition to the types above, Link-Belt builds bar flight, screw, oscillating, rotary table, rotary vane and reciprocating feeders. But Link-Belt offers more than a complete quality line to help you get the most efficient application. Link-Belt engineers base their recommendations upon a working knowledge gained in hundreds of plants over many years. Not only for feeding — for conveying, washing, classifying and screening as well — you can rely on Link-Belt all the way.

LINK-BELT

CONVEYING and PREPARATION MACHINERY

LINK-BELT COMPANY: Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa). Offices in principal cities.

12,505

"We Tripled Our Crushing Capacity with a KUE-KEN"

says *California Operator*

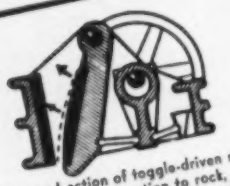
This Operator was using a Blake Type crusher. He then purchased a KUE-KEN, and at no increase in horsepower began crushing 3 times the tonnage per hour, at the same time producing a much greater percentage of fines.

This story is typical of those being experienced by purchasers of KUE-KEN all over the world. KUE-KEN, operating at 375 crushing strokes per minute, or 25 to 50% more than any other crusher, gives you the highest capacity crushing available today. Translated into terms of cost per ton this makes KUE-KEN easily the most economical crusher on the market. KUE-KEN's high speed means you get a finer, more uniform product, too . . . meet specifications easier.

Here's why KUE-KEN's jaw plates outwear any other crusher's 5 times!

See how other jaw crushers act like giant grinding wheels . . . grinding away jaw plates with every stroke.

Moving jaw, driven by an overhead eccentric, forces rock both up and down causing severe rubbing and wear on jaw plates. Overhead Eccentric Type.



Unbalanced action of toggle-driven swing jaw imparts upward motion to rock, causing terrific abrasive action on jaw plates. Blake Type.

A

Hinge pin is so located that jaw swings in a straight line without upward or downward motion. Rock is instantly gripped and crushed.

42" x 27" KUE-KEN. Capacity 250-350 tons per hour. Only 60 H.P. required. Wt. 30,495 lbs.

SELF-LUBRICATING

Only KUE-KEN seals all mechanism against dirt and dust in a "crankcase type" filtered oil bath to permit safe, high-speed long life operation.

Only **KUE-KEN crushes with firm direct strokes that practically eliminate jaw plate abrasion!**

WRITE FOR FACTUAL ILLUSTRATED DATA

STRAUB MFG. CO.

545 CHESTNUT ST. OAKLAND 20, CALIF.

KUE-KEN Pronounced "Coo-Ken." U. S. and foreign patents pending.

DEALERS: **LUND MACHINERY CO., Salt Lake City, Utah: CLOSNER EQUIPMENT CO., San Antonio, Texas: WASHINGTON MACHINERY & STORAGE CO., Seattle, Wash.: CONSTRUCTION EQUIPMENT CO., Spokane, Wash.: HEWITT ROBINS INC., Pasadena, Calif.: EDWARD L. KROPP CO., Portland, Ore.: CAL-ORE MACHINERY CO., Medford, Ore.; MILLER MACHINERY CO., Missoula, Mont.; ANAHUAC MACHINERY CO., Mexico City, Mexico; UNIVERSAL EQUIPMENT CO., Vancouver, B. C.**

Pennsylvania Crusher Co., Exclusive Licensed Eastern Manufacturer and Distributor Broad and Arch Streets, Philadelphia, Pennsylvania.

Sir W. G. Armstrong Whitworth & Co. (Ironfounders) Ltd., Authorized Licensed Manufacturer and Distributor Close Works, Gateshead-upon-Tyne, England.

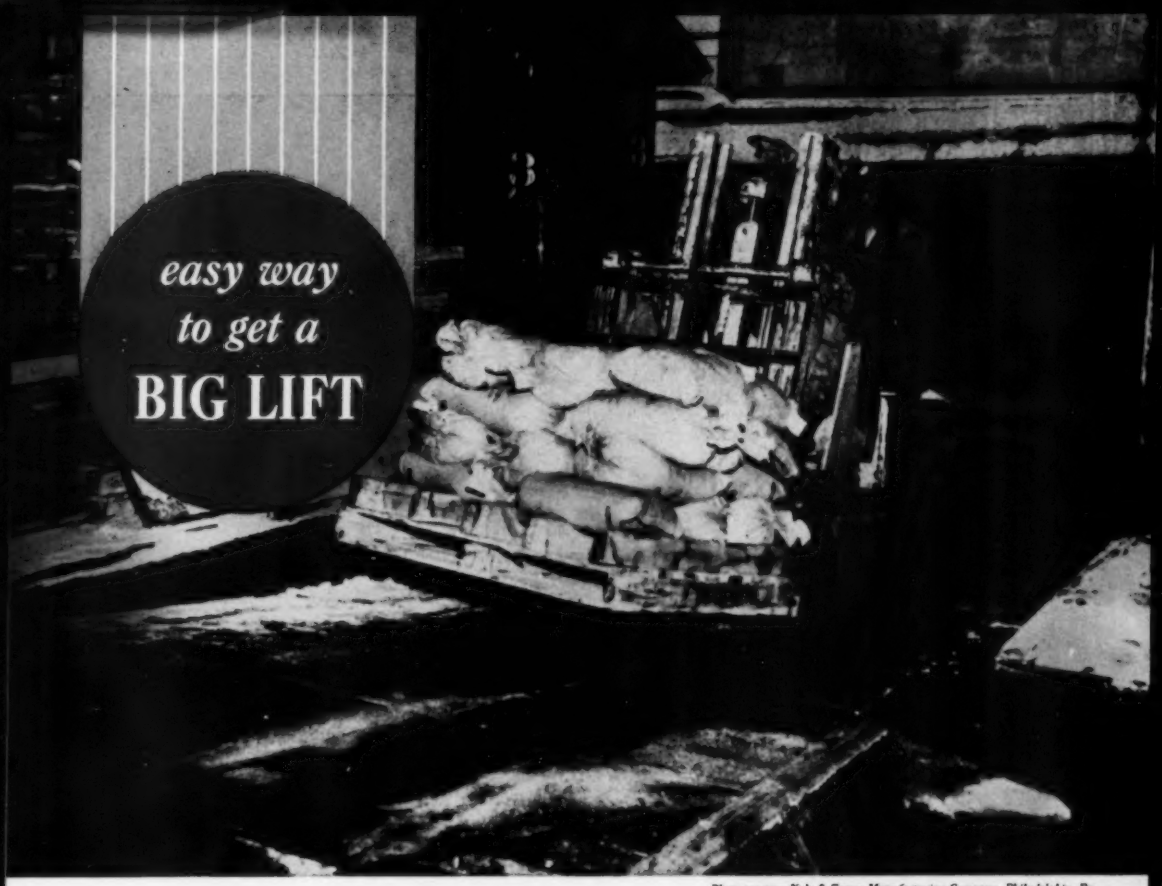
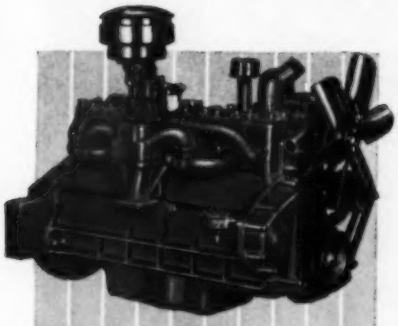


Photo courtesy Yale & Towne Manufacturing Company, Philadelphia, Pa.

damaging clutch shocks eliminated by Chrysler gýrol fluid coupling



Replacing worn out clutches on fork trucks once made maintenance costs a troublesome problem. Then a leading manufacturer of material handling equipment brought the problem to Chrysler Industrial Engineers. They suggested gýrol fluid coupling on Chrysler Industrial Engines to eliminate shock and prolong equipment life. gýrol fluid coupling practically eliminated clutch maintenance, increased efficiency of the fork truck, and contributed greater smoothness in operation.

This is one more example of how Chrysler Industrial Engines are being engineered to do specialized jobs better. Wherever gasoline power is used for industrial purposes you will find many others.

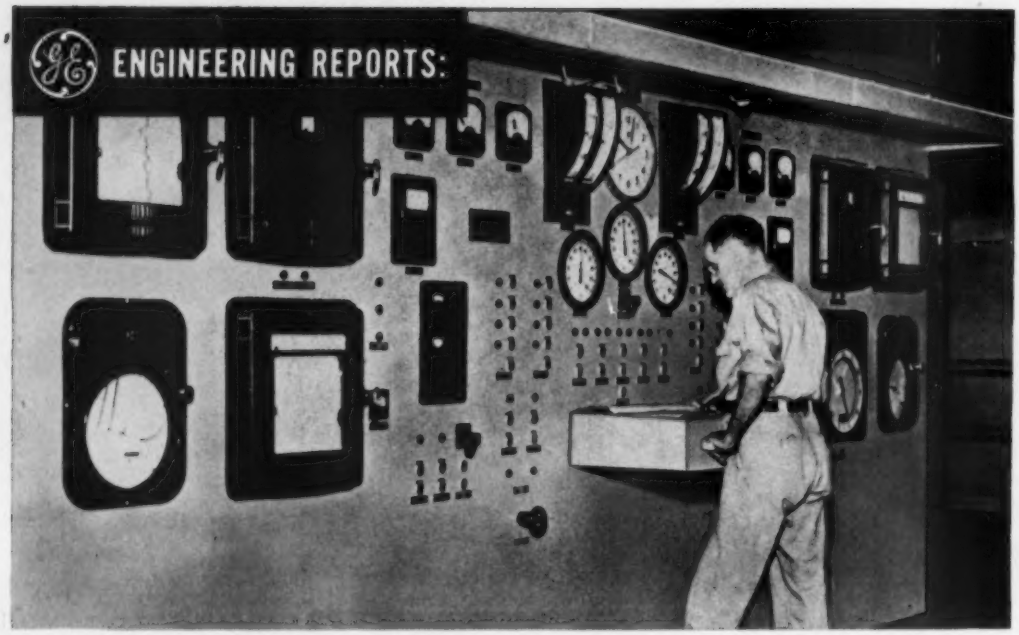
Among the scores of special features available in Chrysler Industrial Engines are superfinished wear surfaces, sodium cooled exhaust valves, chrome top piston rings, updraft or downdraft carburetion and gýrol fluid coupling.

Chrysler Industrial power is not expensive. Production-line methods adapted to specialized industrial engine building, provide a custom-built industrial engine at mass production prices.

See a Chrysler Industrial Engine Dealer. Or if your problem is special, write us direct: ***Industrial Engine Division, Chrysler Corporation, Trenton, Michigan.***

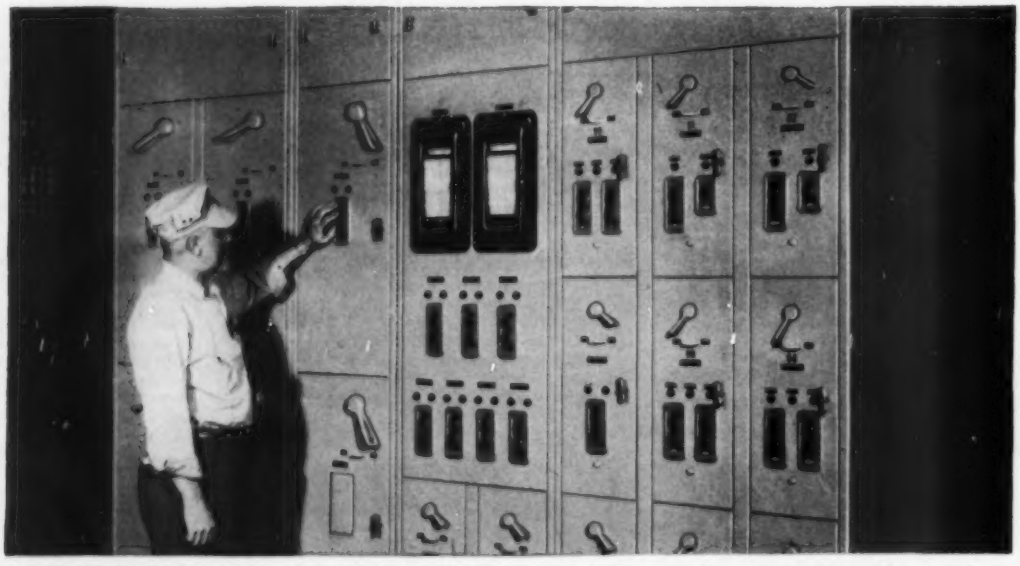
CHRYSLER
Industrial Engines

HORSEPOWER WITH A PEDIGREE



ONE MAN REGULATES all kiln-department functions at a control board in this large western cement plant. Built-in instruments indicate and record necessary data on all department drives, kiln temperatures, gas pressure, etc. The multiple-control panel has interlocked circuits so that kiln operations will be performed with greater efficiency and safety.

Centralized control increases



CENTRALIZED CONTROL for a number of 440-volt motors can be provided by a compact assembly of low-voltage G-E Cabinetrol*. Factory wired, it's easily planned, installed and serviced. Rigid steel enclosure gives workers maximum protection, resists entrance of cement dust.

*Registered trade-mark of General Electric Co.

MANPOWER-SAVING, this G-E control station in a Colorado cement mill brings all related processes in a department under control of one man, provides faster, more uniform production.

SPACE-SAVING, this G-E Limitamp high-voltage motor control combines starters and short-circuit protection in one unit. This lineup controls four 4160-volt synchronous motors.

cement output, saves manpower

Modernizing electrically with centralized control lets you co-ordinate plant operations more closely

Centralized control—as part of a comprehensive program of electrical modernization—can help you make most efficient use of your available manpower. It takes fewer steps by fewer men, for example, to co-ordinate related operations in a cement plant from General Electric control stations. And with interlocked G-E multiple control panels, you can help prevent production tie-ups, keep plant processes flowing evenly.

SYSTEM-ENGINEERED TO YOUR NEEDS

Engineered by skilled G-E industry specialists into a complete system to meet your individual needs, these centralized controls play a big part in moving uniform-quality cements through your plant—continuously, at a maximum rate, with minimum man-hours. Whatever department you plan to modernize—crushing, grinding, kiln, finish, or packhouse—let a G-E cement-industry specialist work with you from the start in planning an electric system that is reliable, safer, amply suited to your requirements.

MODERNIZE STEP BY STEP

Meanwhile, for mill-tested ideas you can use to increase your plant's capacity, send for a new G-E booklet just released. It shows how to modernize electrically to increase tomorrow's production, how to do it step by step to keep today's production going. For your copy, contact your nearest G-E Apparatus Sales Office and ask for Bulletin GEA-5469, or write to General Electric Company, Section 658-9, Schenectady 5, N. Y.

Engineered Electrical Systems for Rock Products Industry

GENERAL ELECTRIC

GM DIESEL CASE HISTORY No. 519-18

USER: Wissota Sand and Gravel Company, Eau Claire, Wisc.

Firm produces 500,000 tons a year.

INSTALLATION: GM 4-71 Diesel replaced gasoline engine in 1¼-yd. dragline four years ago. Firm also repowered two shovels and a portable crusher with GM Diesels and powers a washing plant pump with a 4-71.

PERFORMANCE: With GM Diesel Power, the dragline loads one-third more per day while costing about half as much to operate. Operator says GM starts easier and permits faster swings with quicker recovery under load. Repowered crusher produces 25% more and costs 25% less to run.

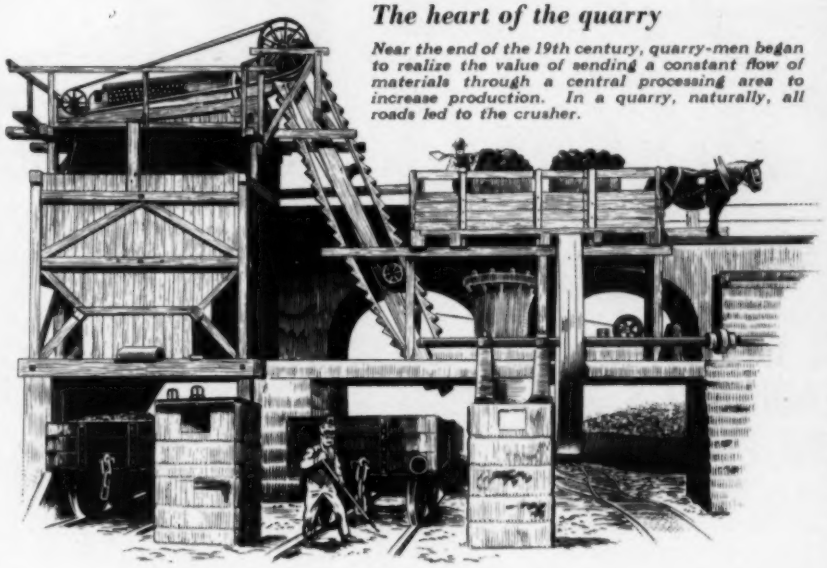
This Diesel Loads 33% More Gravel

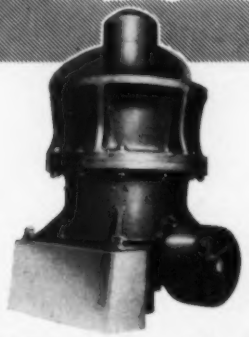
at one-half the fuel cost

GM DIESEL POWER

The heart of the quarry

Near the end of the 19th century, quarry-men began to realize the value of sending a constant flow of materials through a central processing area to increase production. In a quarry, naturally, all roads led to the crusher.





The Traylor TY Reduction Crusher features modern, compact design for maximum production with minimum maintenance. Ask for Bulletin 6112 for specifications and description.

For 50 years, Traylor has worked closely with the men who look for ways to increase their production. As ideas and methods changed, Traylor developed better, more efficient machinery to meet these new standards of production. It is this experience, gained by working closely with customers for half a century that makes an order for Traylor equipment a wise order today.

OUR GOLDEN ANNIVERSARY YEAR
1902 1952

TRAYLOR ENGINEERING & MANUFACTURING CO.
1446 MILL ST., ALLENTOWN, PA.

SALES OFFICES: New York • Chicago • Los Angeles
Canadian Mfrs: Canadian Vickers, Ltd., Montreal, P. Q.

a **Traylor** *leads to greater profits*

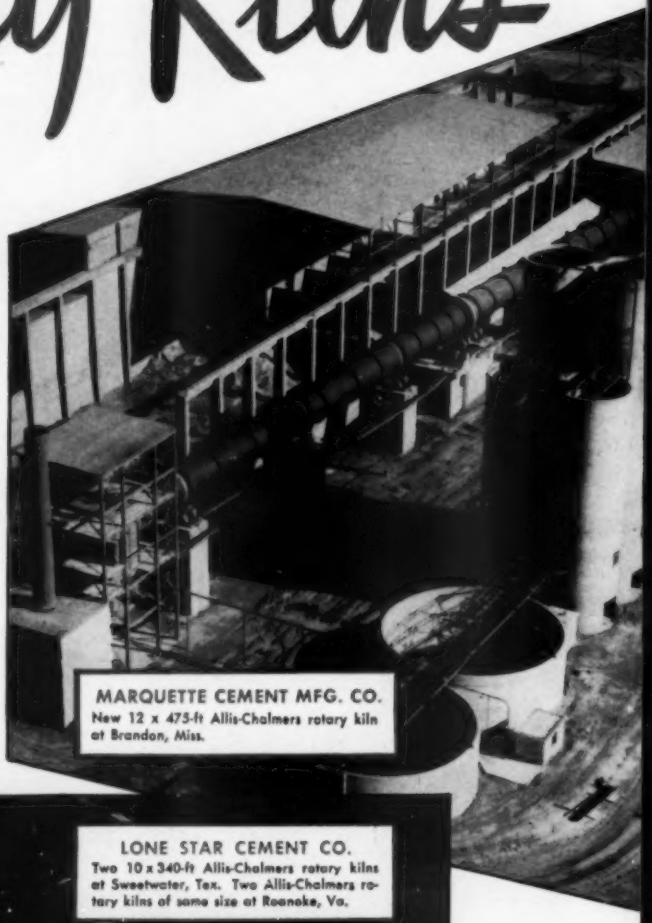
ALLIS-CHALMERS

Rotary Kilns

THE CHOICE OF LEADING U. S. CEMENT PRODUCERS

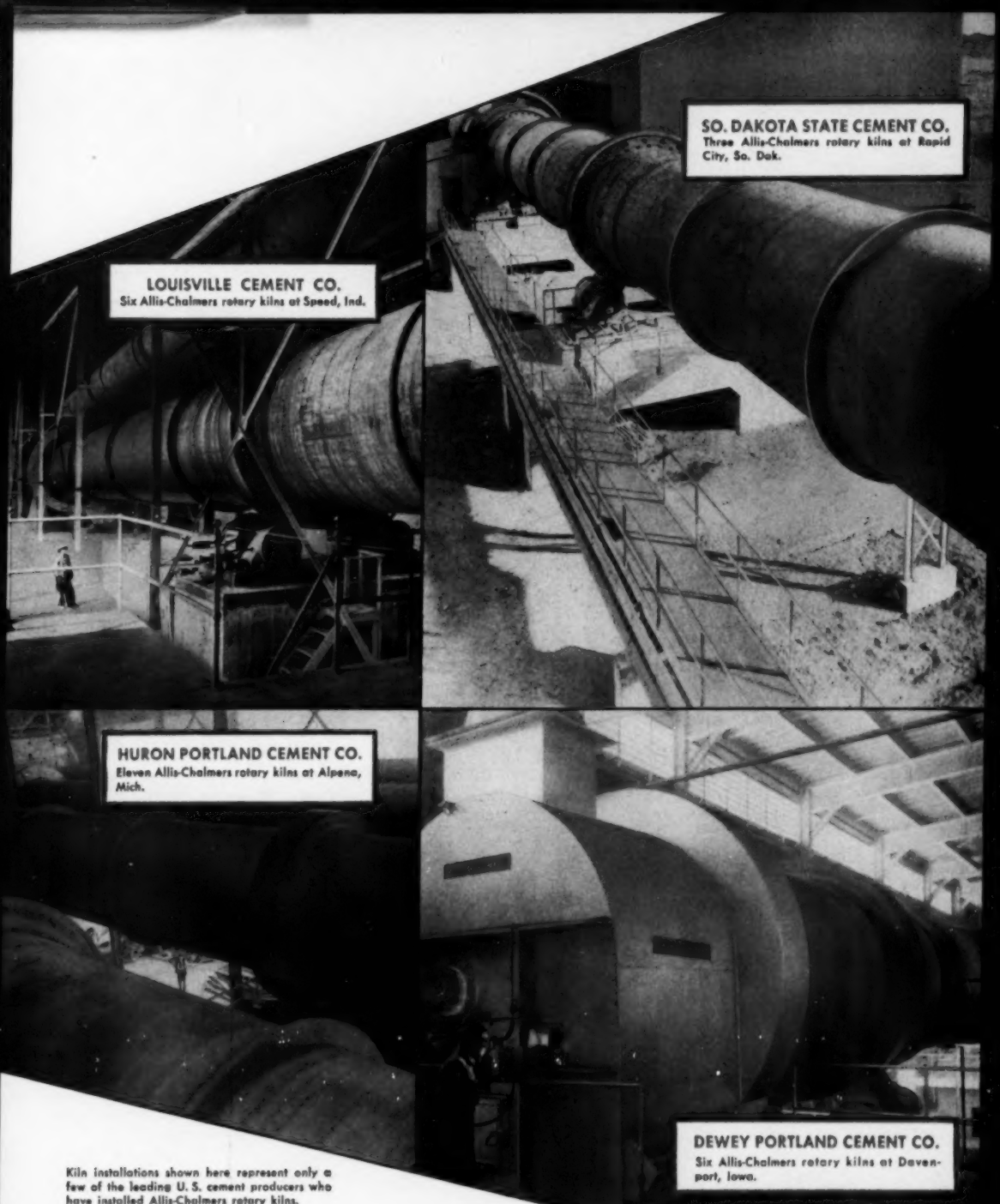
CEMENT OPERATORS have long recognized the splendid performance records of Allis-Chalmers rotary kilns — performance that is the result of Allis-Chalmers specialized engineering and years of experience in building *hundreds* of kilns.

Low production and maintenance costs...dependable performance year after year — these are solid, dollar-saving reasons why so many A-C rotary kilns are being installed in the cement industry today. A-3753



MARQUETTE CEMENT MFG. CO.
New 12 x 475-ft Allis-Chalmers rotary kiln at Brandon, Miss.

LONE STAR CEMENT CO.
Two 10 x 340-ft Allis-Chalmers rotary kilns at Sweetwater, Tex. Two Allis-Chalmers rotary kilns of same size at Roanoke, Va.


LOUISVILLE CEMENT CO.
Six Allis-Chalmers rotary kilns at Speed, Ind.
SO. DAKOTA STATE CEMENT CO.
Three Allis-Chalmers rotary kilns at Rapid City, So. Dak.
HURON PORTLAND CEMENT CO.
Eleven Allis-Chalmers rotary kilns at Alpena, Mich.
DEWEY PORTLAND CEMENT CO.
Six Allis-Chalmers rotary kilns at Davenport, Iowa.

Kiln installations shown here represent only a few of the leading U. S. cement producers who have installed Allis-Chalmers rotary kilns.

Important facts about *profitable* kiln operation can be obtained from the A-C representative in your area. Call him, or write Allis-Chalmers, Milwaukee 1, Wisconsin, for Rotary Kiln Bulletin 07B6368A.

A-C ALLIS-CHALMERS

ALLIS-CHALMERS

Another new SECO?

Yes 2,000,000 tons ago!

*IN SERVICE OF SCOTT COUNTY STONE COMPANY, INDIANA

SECO
TRUE CIRCULAR ACTION
VIBRATING SCREENS

THIS 13 YEAR OLD SECO WORKHORSE JUST FACTORY REBUILT

. . . . READY FOR ANOTHER STRETCH OF SERVICE

After 13 years of big tonnage service, (200,000 tons last year alone) this 4′ x 16′ Seco vibrating screen was returned to the Seco factory for rebuilding. In 13 years of service, *not even one bearing was replaced!*

Here you see it before it was shipped back to Scott County Stone Company for more years of "front line service" with seven other Seco vibrating screens for this successful and well known firm.

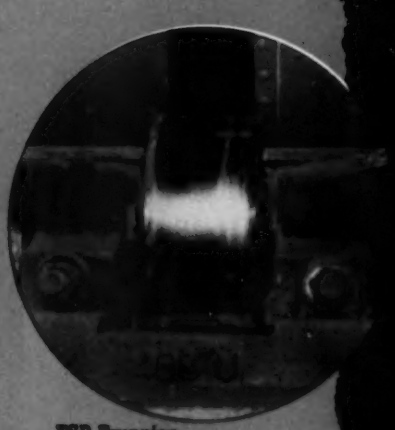
After all, it's performance that counts, and this is another example of Seco dependability on-the-job!

Put Seco vibrating screens on your job for smooth operation, top tonnages and a minimum of maintenance. Send for Catalog #203 today!

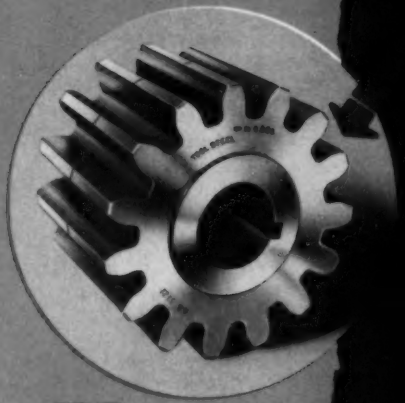
PUT A DEPENDABLE SECO SCREEN ON YOUR JOB

Seco builds over 300 models in single, double, triple and three and one-half decks. Models for every aggregate screening job. Send us your problem. No obligation.

Screen Equipment Co., Inc.
1750 Walden Avenue
Buffalo 25, New York
In Canada: United Steel Corp. Toronto, Ontario



TSP Trunnion. (unretouched photo). Note smooth surface of trunnion and ring.



TSP Kiln Drive Pinion.

IDEAL CEMENT CO.
Boettcher, Colo., reports:

TSP*

SERVICE RECORD

TSP Hardened Trunnions	Competitive Cast Steel Trunnions
14 years—still in service—good for many more years.	3 years—badly worn—discarded.
TSP Hardened Pinions	**Competitive Cast Steel Pinions**
14 years—still in service. Hardly any noticeable wear.	Less than 1 year—worn beyond use.

Phenomenal service record? Not at all! Just a typical example of the long life with resultant dollar savings you can expect from TSP hardened parts in your Cement Mill. Write for Bulletin No. 452.

THE TOOL STEEL GEAR AND PINION CO.
CINCINNATI 16, OHIO, U.S.A.

* TOOL STEEL PROCESS PRODUCTS... the products that carry an absolutely positive GUARANTEE to give a longer life in the same service than any other product.

AD 49

THE STANDARD OF QUALITY SINCE 1909 FOR GEARS • PINIONS • ROLLS • WHEELS AND OTHER HARDENED PRODUCTS

*QUARTER-MILE ROADBED...sun-baked, ice-swept...*YET STILL ON THE MOVE AFTER 14 YEARS OF COAL HAULING SERVICE!!!

Photographs may not lie; but, here's one that falls far short of telling the whole truth about the remarkable performance records chalked up by this Republic Rubber's Coal Handling Conveyor Belt.

But, then it's quite a story! You can see for yourself there's lots of sky overhead and that means sun . . . constant, unrelenting sun beating down on the conveyor belt surfaces, until seasonal changes bring about onslaughts of rain, snow and sleet.

The load, of course, is coal . . . an abrasive, mine run coal that's dropped through chutes and carried by the belt to stockpiles located throughout the dock area.

With these facts in mind and knowing that when the ship moves out, there's nothing to protect the belt against spraying lake water, consider this:

The belt is now fourteen years old and still going strong!!!

Purposefully, we've left the photo unretouched to show you just what a 14-year old Republic Rubber Conveyor Belt really looks like . . . to show you just how well a Republic Conveyor Belt stands against the ravages of time, hard labor and all the elements can throw at it. Incidentally, the dark spots you see on the belt's surface aren't worn places at all. That's water . . . water that makes ordinary conveyor belts mildew and prematurely fail, but holds few terrors for Republic Conveyor Belting because they're "mildew-proofed"!

It's to your advantage to learn why Republic Conveyor Belts like this can year in, year out, many times outperform and outlast other brands of belting.

Despite abrasion, impact, flexing, weathering or contact with heat, oil and chemicals, Republic Conveyor Belts continue to be your best insurance against breakdowns, short life and high handling costs.

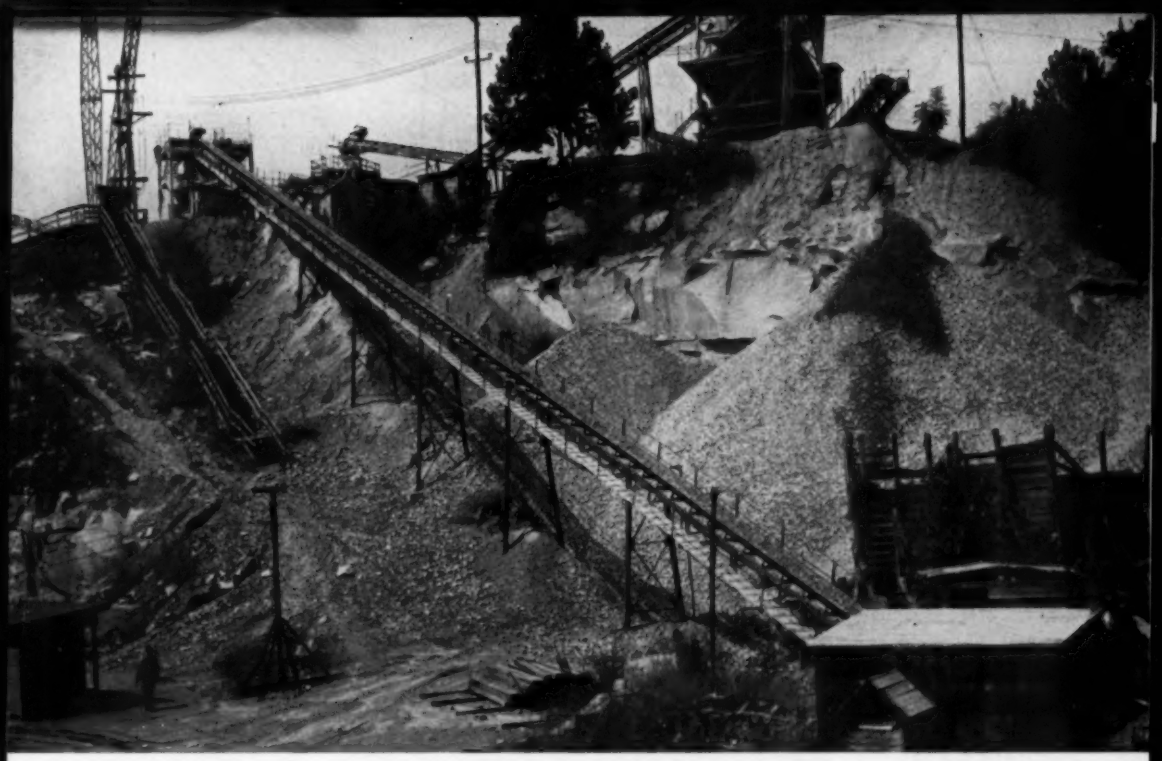
Write us today for the name of your local Republic Rubber Distributor who can offer expert advice and fast service on all industrial Rubber Products.

Remember, whether it's hose, belting, packing or any one of hundreds of different molded and extruded specialties . . . **if it's built of rubber, Republic builds it better!**

REPUBLIC RUBBER DIVISION

LEE RUBBER & TIRE CORPORATION, YOUNGSTOWN 1, OHIO

INDUSTRIAL RUBBER PRODUCTS



At Woodleaf Quarry
(Woodleaf, N. C.)

Belt reinforced with Du Pont "Cordura" gives better service . . . cuts maintenance

VIEW OF "CORDURA"-REINFORCED CONVEYOR BELT from top of fine reduction crusher. This 6-ply belt measures 404.5 feet between enters . . . transports 300 to 400 tons of crushed rock per hour, p an 18-degree slope to a height of 105 feet. Belt speed: 325 feet er minute.

To speed the production of crushed stone, Superior Stone Company's Woodleaf Quarry uses the conveyor belt pictured above, sinewed for extra strength with Du Pont Cordura* High Tenacity Rayon.

Engineers report that this 30" belt, made by Goodyear Tire & Rubber Company, has resulted in increased production and lower maintenance costs for the quarry. It has been in operation eight hours a day, six days a week, for over twenty months, transporting crushed rock from the first secondary crusher to the fine reduction crusher.

Reinforcement with Du Pont "Cordura" assures longer, trouble-free service for belting. That's because man-made "Cordura" yarn is much stronger than yarns made of natural fibers. It provides *greater strength with less bulk* . . . more flexibility, and thus better troughing.

Why not find out more about the advantages of "Cordura" in conveyor belting? We'll be glad to send you the name of a supplier. For complete information about "Cordura," send for your free copy of "Sinews for Industry." Write to: Textile Fibers Dept., Room 4421Q, E. I. du Pont de Nemours & Co. (Inc.), Wilmington 98, Delaware.

*REG. U. S. PAT. OFF.

Du Pont "*Cordura*" High Tenacity Rayon

STRENGTH AT LOW COST

DU PONT

150th Anniversary

BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

VOL. 45 OCTOBER 1952 No. 4

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CHICAGO BUSINESS OFFICE
431 S. Dearborn Street
Chicago 5, Illinois
Telephone HArrison 7-8358

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NEW YORK OFFICE
Room 906, 370 Lexington Avenue
New York 17, New York
Tel. MUrray Hill 5-4438 and 5-4714

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PIT AND QUARRY

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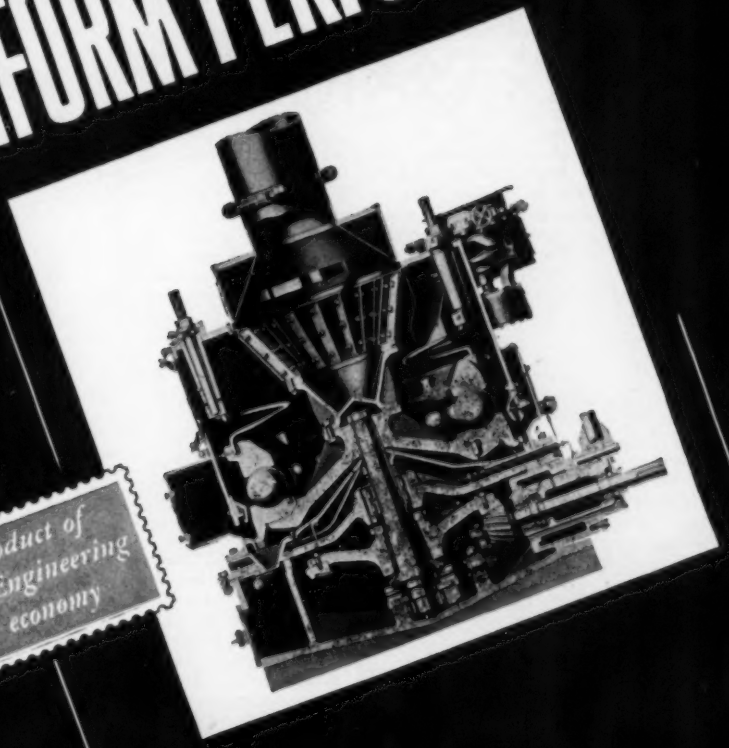
outstanding for

UNIFORM PERFORMANCE



A product of B&W Engineering for economy

More than 200 B&W TYPE E PULVERIZERS for direct-firing of rotary kilns, have outstanding records for uniformly good performance, year after year. Principal contributing features are (1) their consistent delivery of uniformly fine coal to burners at closely controlled, constant rates; (2) their inherent advantage of sustaining rated output within close limits throughout the long life of the ball-bearing grinding elements—an important factor in meeting full load conditions after mills have been in operation for extended periods; (3) automatic one-point control of proper coal-air ratio and volume for most efficient combustion at all loads.

Because of their performance, B&W Type E mills can be depended upon for the most efficient and economical firing of any type and size of rotary kiln.

BABCOCK & WILCOX

editorial

Canada Does It Better

American tourists in record numbers visited Canada during the past summer to view the many scenic wonders that great country has to offer. For many it was the first visit to our northern neighbor; for others, like this writer, it was the latest of numerous rewarding visits. All, however, undoubtedly noticed the high level of business activity and those who know that country realized that boom conditions exist. Many also were puzzled and mortified in varying degrees at the fact that the Canadian dollar was worth more than our own which most of us have come to regard as the world standard. For many years we had been accustomed to receiving a premium on our money in Canada but this is no longer the case. The Canadian dollar has fluctuated between $1.03 and $1.05 in our money for some months.

There are a number of reasons for this condition. It is probably true that the Canadian dollar has risen in relation to ours largely because of a rush of outside investors chiefly from the United States, to develop Canada's mineral, timber and other resources. It is also true that Canada has lowered its restrictions on international trade and proffered other inducements to foreign investors and to industrial growth. Other nations, which are depending on us to provide the capital and the knowledge and techniques to put them back on their feet, could learn much from what Canada has done. By their extreme nationalism, currency restrictions, abnormal tariffs, government controls and monopolies, threats of expropriation, wars and revolutions, etc., many of these countries have discouraged the very things that have made Canada prosperous.

This is far from being the whole story however. Canada has provided an object lesson to other nations, and particularly to us, by curbing inflation, balancing the budget, and reducing the national debt, all without benefit of price controls. This has been going on since 1946. In the April 1949 issue of PIT AND QUARRY we reported that Canada on March 22 of that year was handed the biggest tax slashing budget in its history. In the December 1949 issue we reported that Canadian taxes had been brought down in careful stages over a period of four years and that the budget had been balanced. Personal income taxes were restored to pre-war levels, "nuisance" taxes on a large number of commodities were eliminated, the tax rate was reduced on the first $10,000 of corporate profits to aid small business, and the "double taxation" on corporate profits and dividend payments was reduced in some cases and eliminated in others.

The Economic Research Department of the Chamber of Commerce of the United States recently made a study of these conditions with results which reflect unfavorably on our own economy. The Chamber reports that Canada has reduced the excise tax on a group of durable goods, including automobiles, radios and clocks, from 25 percent to 15 percent and abolished a 15 percent excise tax on refrigerators, washing machines and stoves. On the other hand the cigaret tax, reduced 3 cents per package, is still 20 cents; an 8 percent manufacturers' sales tax remains on most items except food; and a new 2 percent social security tax has been imposed on personal and corporate incomes and manufacturers's sales mainly to provide universal old age pensions. However, the total tax burden in Canada, before the new reductions, amounted to 23.9 percent of total production, compared to 25.8 percent in the United States.

Canada has also lifted credit controls and the consumer's price index has dropped from 191.5 in January to 186.7 in May. The U. S. index in the same period dropped from 189.1 to 189.0 (1935-1939 average equals 100). Canada has had a budget surplus every year since the war. Between 1946 and 1952 the national debt was reduced 17 percent to a total of 11.1 billion, which amounts to $793 for every Canadian. In the U. S. the debt of $260 billion amounts to $1,684 for every person. Per capita income is $1,230 in Canada and $1,786 in the U. S.

The unparalleled productive economy of the U. S. has been hampered by all the uncertainties, confusion, costly red tape procedures, discriminations and labor strife generated by the price controls and so-called wage controls imposed on us. Canada rejected the idea of controls and curbed inflation by a pay-as-you-go policy; by increased taxes on spending, in the form of sales and excise taxes; by credit restrictions, and by raising interest rates to bring the flow of spending into better alignment with the flow of goods and services.

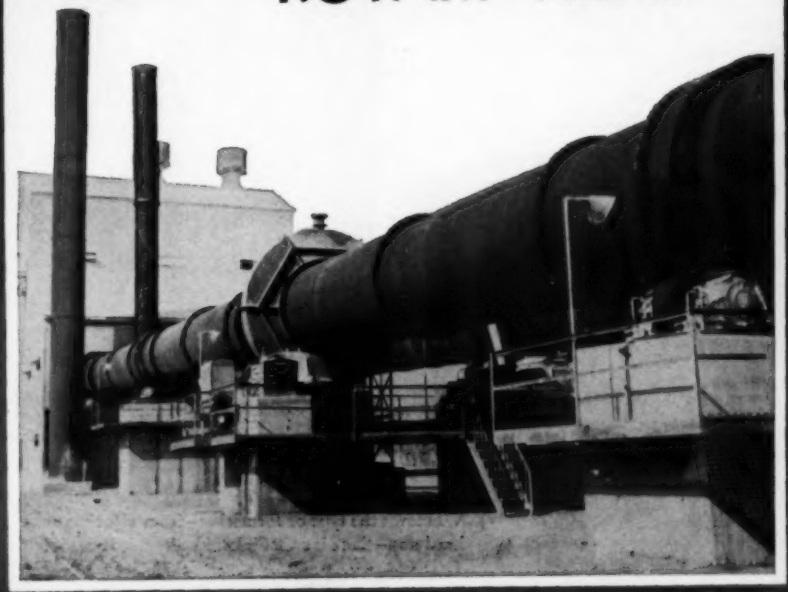
The fact that the Canadian dollar is worth more than ours at the present time, though perhaps only temporarily, should serve as a warning to us of what can, and almost surely will occur if we do not put our economy on a sounder basis. If our profligate methods continue we run the serious risk of a major business decline from which we would not easily recover. Perhaps more important, however, is the fact that we would lose the confidence of free-thinking nations throughout the world who now look upon this country as the leader in the cause of freedom. It would be tragic irony if, for example, our over-generous aid to other countries contributed to our economic collapse, thereby giving the enemies of freedom a free field for expansion.

Both candidates for the presidency are talking about lowering taxes, balancing the budget, reducing the national debt, removing controls and other business restraints, etc. Regardless of the outcome of the election, we should remember these promises and insist that drastic action be taken.

Walter E. Trautfer

SMIDTH

ROTARY KILNS



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news of the industry

PIT AND QUARRY

$5,600,000 Israeli Contract For Border Swamp Project Won by Chicago Concern

Construction Aggregates Corporation of Chicago has been awarded a $5,600,000 contract by the Jewish National Fund for dredging and construction works in the Huleh swamps on the Israel-Syrian border.

The project includes dredging the canals northward to Lake Huleh and constructing a wall around a 3,300-acre peat region on the northern shore. Construction Aggregates has contracted to supply heavy equipment for the work. Israel's first attempt at dredging operations last year set off frontier incidents which flared into battles between Israel and Syria.

Construction Aggregates is headed by J. R. Sensibar (see "Men of the Industry," PIT AND QUARRY, June, 1952, page 109), who has been in Jerusalem concluding negotiations for the contract. According to Ezra Sensibar, his brother, the company will send two dredges to Israel early next year. It was indicated that the project will require about three years.

DMPA Arrangement Assures Increased Fluorspar Output

The nation's supplies of acid grade fluorspar, a mineral vital in the production of aluminum and aviation gasoline, will be increased by 50,000 tons a year as the result of an agreement between the Defense Materials Procurement Agency and St. Lawrence Fluorspar, Inc., it was announced by Jess Larson, Administrator of DMPA.

The increased production will necessitate extensive improvements and additions at both the company's plant at Wilmington, Del., and the properties of its affiliated concern, the St. Lawrence Corporation of Newfoundland, in Canada. Ore will be mined and preliminary concentrates will be produced by the Newfoundland facilities. The preliminary concentrates, in turn, will be converted to acid grade concentrates at the Delaware plant.

Mr. Larson said that the expansion program will include, among other improvements, the construction of a sink-and-float plant at the Newfoundland site and the construction of a new flotation mill in Wilmington.

The government has agreed to advance St. Lawrence Fluorspar, Inc., up to $1,250,000 to launch the expansion. Total output of the additional facilities will go for defense and other essential industrial uses, Mr. Larson stated. The contract covers a period of four years or until 150,000 short tons of final concentrates have been produced.

This is the second agreement negotiated by DMPA to increase the country's supplies of fluorspar. The other agreement, with the Ozark-Mahoning Company of Tulsa, Okla., provides for an increase of 20,000 tons a year.

El Paso Perlite Co. Begins New Operation in N. M.

The El Paso Perlite Company recently began producing crushed perlite ore (obsidian) from a plant at Gage, N. M., according to J. W. Denney, president. The plant is a pilot model, with a daily capacity of 75-90 tons. Additional equipment to be added soon will boost crushing capacity to approximately 300 tons daily.

Obsidian for the plant is being quarried from a surface deposit 16 miles northwest of Gage, which is estimated to contain nearly 20,000,000 cubic yards of perlite ore. The company is planning to construct a processing and sizing plant in El Paso shortly.

A recent issue of *Ideal Cement Mixer*, official publication of the Ideal Cement Company, featured the retirement of 46 long-time employees under the firm's pension plan. Two of these employees had records exceeding 40 years each.

6th Grasslands Congress Held at Penn State—Attracts 2,000 Scientists

Over 2,000 soil scientists from 48 states and 56 foreign countries met recently at Pennsylvania State College under the sponsorship of the Sixth International Grasslands Congress. This was the first such meeting to be held in the United States.

The purpose of the Congress is to exchange the latest information developed by the world's foremost grasslands experts for the mutual benefit of all. The United States, through its Agricultural Conservation Program, which offers each farm each year specific assistance in completing soil-building practices, has taken the lead in stopping the great waste of the earth's greatest natural resource.

Only a few years ago there were 3¼ acres of tillable land per person in this country; today there are less than 2½ acres per person. If we do not take care of the land, this ratio not only may continue to shrink, but we in this generation may find it difficult to maintain our standard of living. Furthermore, future generations will not be left adequate means to feed themselves if we do not take proper measures to preserve our soil.

Meetings such as the one held at Pennsylvania State help to bring our farmers the latest technological information to assist them in carrying out good soil management practices. These include applying the essential lime and fertilizer to insure proper growth of legumes and grasses.

Coming Events

October 20-24, 1952—Chicago. 40th National Safety Congress and Exposition. Conrad Hilton, Congress, Morrison, Sheraton, and LaSalle hotels.

January 18-21, 1953—Washington. Annual convention, National Agricultural Limestone Institute, Inc. Hotel Statler.

January 25-29, 1953—Cleveland. 33rd annual convention and exhibit, National Concrete Masonry Association. Public Auditorium.

February 23-26, 1953—San Francisco. 37th annual convention, National Sand and Gravel Association. Hotel Fairmont.

February 23-26, 1953—San Francisco. 23rd annual convention, National Ready Mixed Concrete Association. Hotel Fairmont.

National Lime Assn. Awards Honors to Plants In 1951 Safety Contest

Certificates of Honor have been awarded by the National Lime Association to 12 lime plants enrolled in the 1951 National Lime Association Safety Competition, conducted by the U. S. Bureau of Mines for their outstanding safety records during the year. These injury-free operations in the four groups into which participating plants are classified are:

Quarries With Calcining Plants Working 100,000 or More Man-Hours— Natividad plant, Salinas, Calif., operated by the Kaiser Aluminum and Chemical Corporation for 297,149 man-hours; Luckey plant, Luckey, Ohio, operated by the National Gypsum Company for 214,360 man-hours; Knoxville plant, Knoxville, Tenn., operated by The Standard Lime and Stone Company for 113,909 man-hours.

Quarries with Calcining Plants Working Less Than 100,000 Man-Hours— Thomasville plant, Thomasville, Pa., operated by The J. E. Baker Company for 75,400 man-hours; McCoy plant, Norristown, Pa., operated by the Warner Company for 67,880 man-hours; Valders plant, Valders, Wis., operated by the Valders Lime and Stone Company for 39,915 man-hours; Ripplemead plant, Ripplemead, Va., operated by the Ripplemead Lime Company, Inc., for 37,437 man-hours; Frederick plant, Frederick, Md., operated by the Shank and Etzler Lime Company for 11,555 man-hours.

Underground Mines With Calcining Plants— Bell plant, Bellefonte, Pa., operated by the Warner Company, Bellefonte Division, for 636,543 man-hours; Quincy plant, Quincy, Ill., operated by the Menke Stone and Lime Company for 49,280 man-hours.

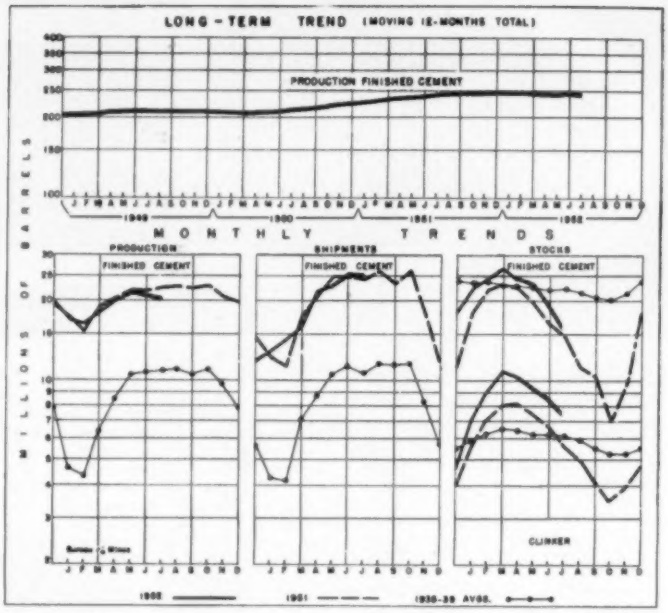
Calcining Plants Only— Springfield plant, Springfield, Mo., operated by the Ash Grove Lime and Portland Cement Company for 78,545 man-hours; Buffalo plant, Buffalo, N. Y., operated by The Kelley Island Lime and Transport Company for 91,252 man-hours.

An aggregate of 1,713,225, or 16 percent of the total man-hours, was worked without any lost-time injuries at these 12 plants. The 1951 injury experience at the 47 plants enrolled in the competition was more favorable when compared with that in 1950. The frequency rate of 22.776 injuries per 1,000,000 man-hours and the severity rate of 3.091 days lost per 1,000 man-hours of work were lower than the 1950 respective rates of 26.076 and 3.566. Both rates were lower than the 17-year average rates since the start of the competition in 1935.

A total of 10,932,408 man-hours was worked at the enrolled plants in 1951. During this worktime, there were 3 fatalities, 13 permanent partial, and 233 temporary total injuries; a total of 249 disabling injuries. The total time loss as a result of these injuries was 33,794 days.

The injury frequency rate was lowest at 19 enrolled quarry and calcining plants with 100,000 or more man-hours of worktime and highest at 10 underground mines having calcining plants. The lowest injury severity rate was made at 10 plants in the "calcining plants only" group and the highest rate at 8 plants in the "quarry and calcining plants with less than 100,000 man-hours" group.

The prevailing accidents resulting in injuries were falls of persons, burns, haulage, and handling material other than rock. At the 47 enrolled plants, these types of accidents made 56 percent of all injuries. Those resulting in the most severe injuries were falls and slides of rock, machinery, flying objects, and haulage, with respective severity rates of 647.9, 325.7, 309.0, and 288.2 days lost per injury. A slide of rock was responsible for one fatality; one employee was killed in connection with haulage, and one lost his life in a machinery accident.



SUMMARY—Production of finished portland cement in July, 1952, totaled 21,342,000 barrels, as reported to the U. S. Bureau of Mines, representing a 5 percent decrease from the July, 1951, figure. Mill shipments totaled 25,084,000 barrels—an increase of 3 percent, as compared to shipments in July, 1951, while stocks of 15,154,000 barrels of finished portland cement were 2 percent greater than those of a year ago. Clinker production during the month was 4 percent less than in July, 1951, and amounted to 20,542,000 barrels.

PRODUCTION—One hundred and fifty-five (155) plants located in 37 states and Puerto Rico reported a production of 21,342,000 barrels of finished portland cement during the month, as compared to 152 plants which manufactured 22,439,000 barrels in July, 1951. Clinker production during the month totaled 20,542,000 barrels—4 percent less than in the preceding July.

SHIPMENTS—Mill shipments of finished portland cement increased 3 percent over the total reported for July, 1951. Shipments were greater in 11 districts and lower in 8 districts, as compared to shipments in July, 1951. The percentage changes range from a 78 percent increase in the Kansas district to a 37 percent decrease in the western Pennsylvania-West Virginia district. Marked increases in shipments were also shown by the Iowa, the Virginia-Georgia-Florida-Louisiana-South Carolina-Mississippi, and the western Missouri-Nebraska-Oklahoma-Arkansas districts.

STOCKS—Mill stocks of 15,154,000 barrels of finished portland cement were reported at the end of July, 1952—2 percent greater than on the same date in 1951, while stocks of clinker amounted to 7,460,000 barrels—33 percent greater than at the same time last year.

Black Rock Desert Mineral Enlarges Sulphur Operation

Officials of the Black Rock Desert Mineral Company, Winnemucca, Nev., have completed arrangements for the installation of additional milling facilities and a refining plant at the firm's sulphur property at Sulphur, Nev.

According to Harold J. Adams, president, the company has allocated $100,000 to increase output to 400 tons of agricultural sulphur and 125 tons of pure chemical mineral daily.

Black Rock began operations last year, and has been shipping agricultural sulphur to American and European markets. The company controls 1,100 acres of patented mineral land in the Devil's Corral area, which is estimated to contain 5,000,000 tons of commercial grade sulphur.

Banquet of So. Cal. R.P. and R.M.C. Ass'ns. in honor of Vincent P. Ahearn

Vincent P. Ahearn Feted By California Producers At Dinner in Los Angeles

Members of the Southern California Rock Products and Ready Mixed Concrete Associations gathered at the Biltmore Hotel in Los Angeles on the evening of August 18 for an industry dinner honoring Vincent P. Ahearn of Washington, D. C.

Mr. Ahearn, executive secretary of the National Sand and Gravel Association and the National Ready Mixed Concrete Association, addressed the group after the dinner. Drawing upon his more than 30 years of business life in the nation's capital, he made some critical observations of the political picture, past and present, and some astute predictions on the future course of governmental events as they may affect the building materials industries in general. Much of his talk revolved about labor-management relations and proposed attempts to solve the problem of recurring strikes by legislative means.

Mr. Ahearn ventured the opinion that strong efforts will be made to nullify strikes affecting the public welfare, and to repeal the Taft-Hartley Act, but he doubted that either would be successful. The only real deterrent to strikes, in his opinion, will be at the local level, with management making a concerted and real effort to recapture the loyalty and confidence of its workers.

H. E. Bender, president and general manager of the Azusa Rock & Sand Company, presided at the meeting. Guests present included producers from as far away as Salt Lake City, Albuquerque, and Phoenix. Approximately 140 persons were in attendance.

Boynton, Jander Co-authors Of Lime-and-Limestone Text

Of interest to nonmetallic minerals producers is an illustrated article on lime and limestone, reprinted from the new *Encyclopedia of Chemical Technology*, a publication of Interscience Encyclopedia, Inc., New York. Co-authors of the 36-page dissertation are Robert S. Boynton and Kent Jander, both of the National Lime Association.

According to Mr. Boynton, the book covers production, marketing, economics, and fundamental characteristics of lime and limestone. Since it is a chemical engineering encyclopedia, the emphasis is on chemical process uses, although both construction and agriculture are also described.

Price, per copy, 25 cents, plus postage. Orders should be sent to the authors at the National Lime Association 925 15th Street, N. W., Washington 5, D. C.

Southwest Potash Corporation To Open Plant at Carlsbad

The Wage Stabilization Board has approved a wage schedule for about 198 employees of the Southwest Potash Corporation of Carlsbad, N. M., which is opening a new mine and refinery there.

The company was organized in 1948, development of the mine and construction of the refinery were begun in December, 1950, and partial operation of the plant has begun.

Cover Picture....

The view shown on the front cover is an aerial picture of the Noralyn plant of International Minerals & Chemical Corporation near Bartow, Florida. This plant is said to be the world's largest phosphate producer, and is described in detail in the story on page 84 of this issue.

$200,000 Fire Sweeps Plant Of Chandler Firm at Lomita

Fire caused damage estimated at approximately $200,000 on August 28, when it swept through the washing-and-screening plant of Chandler's Palos Verdes Sand & Gravel Corporation, Lomita, Calif., south of Los Angeles.

Five fire-fighting companies battled the blaze for hours. The plant's equipment was almost totally destroyed and rebuilding is expected to require several months, according to L. H. Chandler, president. Capacity of the destroyed facility was approximately 250 t.p.h., about 90 percent of the output being sand.

Consolidated Rock Products Honors 129 Staff Veterans

Among the 129 employees of the Consolidated Rock Products Company, Los Angeles, Calif., who received service pins last July were the following: Laird Haney, purchasing agent, and Robert Mitchell, president—both 30-year men; and Quentin W. Best, vice-president, a 25-year-service veteran.

Together the 129 who were awarded the honor pins have served a grand total of 1,380 years.

New Pumice Plant Opened In Southeastern Idaho

Pumice Inc. of Twin Falls, Idaho, has recently started a large-scale operation at Ammon, Idaho. This company is reportedly exploiting part of a vast 20 square-mile pumice deposit located about 15 miles east of Idaho Falls.

Facilities at the Ammon plant include crushers, pulverizers, driers, screens, calcining kiln, air conveyors, storage bins, laboratory, warehouse, and associated buildings.

● Correction

In the September issue on page 81, top right illustration, B. R. Maloney was identified as being with the American Cyanamid Company. We are sorry that this occurred. Mr. Maloney is manager of the Explosives Department of E. I. DuPont de Nemours & Company.

July, 1952, Construction Shows Rising Trend In East and Midwest

Construction contracts awarded in the 37 states east of the Rockies in July were $1,511,285,000 or 2 percent ahead of June and 10 percent ahead of the July, 1951, total, it was stated by F. W. Dodge Corporation, construction news and marketing specialists. The total for the first seven months of the year was $9,269,863,000 or 9 percent behind the 1951 comparable total of $10,100,000,000.

July non-residential contracts were $562,686,000 or 2 percent more than in June and 5 percent more than in July last year. Non-residential for seven months was $3,261,661,000, down 29 percent from that of the same period last year.

Residential awards for July were $608,078,000, a 5 percent gain over June and 11 percent more than July, 1951. Residential for seven months was $3,952,115,000, up 2 percent over the 1951 figure.

Public and private works and utilities at $340,521,000 in July were 4 percent less than in June of this year but 15 percent more than in July a year ago. For seven months public and private works and utilities at $2,056,087,000 were 20 percent ahead of the corresponding period in 1951.

AIME to Hold Annual Meeting In Los Angeles Next February

Los Angeles will play host to one of the most historic meetings of American Institute of Mining and Metallurgical Engineers Feb. 16-19, 1953, when the 175th General Meeting is scheduled to take place. Plans indicate that the meeting will be one of the largest A.I.M.E. meetings ever held.

Headquarters will be the ultra-modern Hotel Statler, now nearing completion of construction. The first of the more than 75 technical sessions will take place Feb. 16. The Mineral Industries Education Division and the Board of Directors meet Feb. 15. Sessions will end with a meeting of the Council of Section Delegates on Feb. 19.

• This year that American institution, the Community Chest plan, has been combined with the United Defense Fund under the United Red Feather Campaigns. October is the high-point of this nation-wide drive, which aids 17,000 services for children, families, leisure time activity organizations, health groups, and the national emergency. United Defense Fund contributions provide for the recreation needs of our service men and defense production workers, as well as for aid to destitute Koreans. Such services are administered by the following: U.S.O., United Community Defense Services, American Relief for Korea, American Social Hygiene Association, United Seamen's Service, and National Recreation Association. The staff of Pit and Quarry wholeheartedly endorse the United Red Feather Campaigns and hope that our readers will support their local drives.

International Minerals Shows Higher Sales, Net Earnings

According to preliminary figures released recently by Louis Ware, president, net sales of International Minerals & Chemical Corporation for the 12 months ended June 30, 1952, were $84,570,447, as compared with $66,257,447 for the corresponding 12-month period ended June 30, 1951; this was an increase of 28 percent.

Net earnings for the 12 months ended June 30, 1952, were $6,653,251, as compared with $6,514,130 for the preceding 12 months—an increase of 2 percent.

Earnings for the 12 months ended June 30, 1952, were equivalent to $2.90 per share on the 2,161,511 shares of common stock outstanding June 30, 1952. This compares with $3.06 per share on the 2,000,000 shares of common stock that were outstanding June 30, 1951.

June Lime Sales Decrease One-Third from May Figure

Domestic sales of open-market lime were 454,041 short tons during the month of June, about a third less than the 676,457 tons reported for May, according to reports of producers to the U. S. Bureau of Mines. Dead-burned dolomite sold or used by producers dropped sharply (72 percent), owing principally to the curtailment of steel production caused by the steel strike. Agricultural, chemical, and other industrial uses also decreased in June whereas building lime output increased slightly.

In its monthly survey of lime, the Bureau of Mines has asked the producers to furnish an annual lime burning capacity, assuming that the kilns are operated 330 days per year, and excluding kilns which have not been operated within the last three years. The results of the June tabulation indicates that present annual lime burning capacity is estimated by the producers to be approximately 8,600,000 tons.

Universal Atlas Officials Reveal Modernization Plan For Universal, Pa., Works

As a result of studies made by Universal Atlas Cement Company, plans have been developed for the modernization of its Universal, Pa., plant. Started in 1907 and enlarged in 1910, the plant became one of the largest of its kind in America. For the last 45 years it has been one of the principal suppliers of cement in the tri-state area.

The modernization program calls for the replacement of three departments: (1) raw material storage and grinding; (2) kilns; (3) clinker grinding. To provide for continous production during construction, the departmental replacements will be undertaken in three separate stages. The first stage, on which engineering work has begun and for which equipment is being ordered, consists of the installation of a covered raw-material storage served by an 80-ft. span bridge crane, three rotary driers, and two raw-grinding mill units.

The raw materials at this plant contain moisture to an extent that drying is necessary before grinding. After completion of the installation of rotary kilns, or the second stage, the waste gases from the kilns will be used to dry these materials. In the interim, pulverized coal will be burned for drying. All dry material bins and machinery in the raw grinding department will be vented to cloth-filter dust-collectors. Dust in the gases from the driers, which after completion of the second stage will consist of the kiln waste gases, will be collected by mechanical dust-collectors, followed by electrical precipitators.

It is anticipated that the first stage of the modernization program—the new raw material storage and grinding department—will be in operation in the latter part of 1953 or early in 1954 and that construction of the second stage—kiln installation—will follow closely thereafter.

Table I.—Lime Sold by Producers [1] in the United States, April-June, 1952 by Types and Major Uses, in Short Tons

	April 1952	May 1952	June 1952	Total, 2nd Quarter 1952
By types:				
Quicklime	499,689	513,606	300,534	1,313,829
Hydrated lime	186,680	162,851	153,507	503,038
Total lime[2]	686,369	676,457	454,041	1,816,867
By uses:				
Agricultural:				
Quicklime	8,437	7,276	3,214	18,927
Hydrated lime	34,897	22,743	15,977	73,617
Total	43,334	30,019	19,191	92,544
Building:				
Quicklime	17,817	18,683	18,701	55,191
Hydrated lime	85,250	79,764	81,072	246,086
Total	103,067	98,447	99,773	301,287
Chemical and other industrial:				
Quicklime	312,724	320,709	231,078	864,511
Hydrated lime	66,523	60,344	56,458	183,325
Total	379,247	381,053	287,536	1,047,836
Refractory (dead-burned dolomite)	160,721	166,938	47,541	375,200

[1] Also includes a small quantity of caustive tonnage (6-7 percent of the total reported herein) to maintain comparability with the annual lime statistics.
[2] Approximately 60 percent of lime produced is high calcium and 40 percent high magnesium.

Johns-Manville Corp. To Develop Asbestos Mine In Southern Rhodesia

Officials of the Johns-Manville Corporation, which operates two asbestos mines in Canada, one of them rated the world's largest, have announced plans for the immediate development in Africa of a third asbestos mine.

The new asbestos ore properties are located at Mashaba in the Victoria District of Southern Rhodesia, about 200 miles south of Salisbury and 120 miles east of Bulawayo. The project is part of Johns-Manville's long-range program to maintain adequate supplies of asbestos ore for many years to come, according to A. R. Fisher, president.

Plans call for development of the asbestos ore properties of Rhodesian Asbestos Limited and construction of a small central mill to process asbestos-bearing ore extracted from the mine. Rhodesian Asbestos Limited was formed in December, 1951, and is under the direction of Canadian Johns-Manville Company, Ltd., a subsidiary of the American corporation, in association with British Metals Corporation, Ltd., Anglo-Huronian Ltd., Southern Minerals & Marketing Corp., (Pty) Ltd., and the Simon I. Patino interests.

James Robert Ewing, a widely experienced mining engineer formerly with Southern Minerals & Marketing Corporation of Southern Rhodesia, has been appointed mine manager, according to Mr. Fisher. Mr. Ewing holds a master's degree in geology from Queen's University, Kingston, Ontario.

Other asbestos mines operated by Johns-Manville include the one at Asbestos, Quebec, and another at Munro Township, near Matheson, in northern Ontario.

Lincoln Sand & Gravel Co. Launches Big Stripping Job

Tractor-scraper teams and rubber-tired earthmovers are being used in place of power shovels and trucks on a large gravel pit stripping job for the Lincoln Sand and gravel company near Lincoln, Ill., where the G. S. Chastain Construction Company, recently contracted to strip some 60,000 cu. yd. of overburden from a three-acre plot underlain by a 40-ft.-deep sand and gravel deposit. Lincoln is said to be one of the largest producers of this material in the state, with an annual output of 350,000 tons of sand and gravel.

The property now being stripped carries from 6 to 7 ft. of overburden and adjoins a 225-acre lake which has formed in the worked-out area. Once the overburden has been stripped away, water from the lake fills the pit and the company pumps the sand and gravel to the processing plant.

Six major earthmoving units are employed to dig and haul the overburden—an International TD-24 with 18-cu. yd. scraper, and five rubber-tired earthmovers. These units are push-loaded by an International TD-18A crawler equipped with an Isaacson bulldozer, which also pushes up earth.

The earthmoving units haul the stripped material to the opposite side of the lake, where it is dumped. An International TD-14A crawler equipped with a Hough front-end shovel casts the material into the lake.

This method of material disposal has been standard practice on the company's property for 20 years, but, since the sand and gravel excavated greatly exceed the amount of overburden dumped in the lake, the lake continues to increase in size, providing plenty of water for the pumping operations. A portion of the lake has now been abandoned by the company and converted into a state fish preserve. This section is continually patrolled and provides a recreational area.

Frank G. Erskine

Expanded Shale Institute Names Frank G. Erskine To Mgr.-Director Post

Frank G. Erskine, for seven years engineer of the Housing and Cement Products Bureau of the Portland Cement Association at Washington, D. C., has been appointed managing director of the new Expanded Shale Institute, it was announced by S. Carl Smithwick, president of the Institute. The Institute's headquarters for the present will be in the National Press Building in Washington, D. C.

Mr. Erskine received his B. E. degree from the University of Mississippi and his degree in civil engineering from Cornell University. He is considered an authority in the field of lightweight aggregates and their uses in both block manufacture and monolithic concrete.

Membership in the Expanded Shale Institute is limited to producers of uniformly high-quality material and to those employing the rotary kiln process.

Israeli Visitors Examine N. Mexico Potash Operation

Visitors from abroad at the Carlsbad, N. M., potash mine of the International Minerals and Chemical Corporation last summer included three tourists from Jerusalem, Israel. They were Dr. F. Yaron, principal research officer, Research Council of Israel; Dr. N. Kuhn, chief engineer, Israel Potash Company, Ltd.; and Dr. R. Block, director of research, Palestine Potash Company, Ltd.

The guests showed lively interest in the mining and refining methods used at Carlsbad. In Israel the potash is made from the brines of the Dead Sea.

1951 Canadian Construction Establishes Record Volume

Preliminary construction figures for Canada during the last year exceeded $2,000,000,000, suggesting a total of about $2,300,000,000, according to James A. Daley of the *Engineering and Contract Record*, Toronto.

The expected total represents an increase of 50 percent over the previous year's record construction, and an increase of twice the actual volume of construction carried out in the boom year of 1929, allowing for the change in the value of the dollar. Engineering construction accounted for more than one third of the 1951 total.

Tractor-scraper team in operation at Lincoln Sand and Gravel.

N.C.S.A. Safety Contest Results Announced by Bureau of Mines

According to the U. S. Bureau of Mines, the injury experience at crushed stone plants enrolled in the 1951 National Crushed Stone Association Safety Competition was one of the best in the 26-year history of the contest. The injury severity rate in 1951 of 2.515 days of lost time for each 1,000 man-hours of work was a 54 percent reduction from the rate of 5.462 in 1926, the first year of the competition, and it was also the second-lowest rate on record. (The record rate of 1.093 was established in 1945.) In 1951, the frequency rate of 19.182 injuries for each 1,000,000 man-hours of work was bettered in only three previous years, and it was the lowest rate since 1941. Except for a slight increase in the 1950 frequency rate, the frequency and severity rates have improved appreciably in each of the last five years. This pattern attests to the co-operation of employees and supervisors in well-organized and efficient safety programs to reduce injury-producing hazards. The continuing improvement in the safety records of participating plants proves the value of competition.

The Port Inland quarry of the Inland Lime and Stone Company at Gulliver, Mich., had the best safety record in the 1951 National Crushed Stone Association Safety Competition for having an operating time of 808,389 man-hours without a disabling injury. For this outstanding accomplishment in safety it won the symbolic bronze plaque, an award of recognition, provided by the *Explosives Engineer Magazine*. The award in 1951 was the fifth time the Port Inland quarry has had the best safety record of participating operations, having been previously so honored in 1933, 1934, 1938, and 1939. This quarry has been enrolled in the competition in each of the last 19 years, and during this period the frequency and severity of injuries have been well below the overall experience of the industry. The Association, in recognition of the plant's 1951 safety record, awards a suitable certificate to each individual who contributed to this performance.

The Bell underground limestone mine of the Warner Company, Bellefonte, Division at Bellefonte, Pa., had the second-best safety record in the 1951 contest. This plant was operated 327,395 man-hours without any lost-time injuries. Third place in the contest was won by the Security quarry of the North American Cement Corporation at Hagerstown, Md. There were no disabling injuries at this plant during 172,061 man-hours of worktime.

Eight quarries and one underground mine had no lost-time injuries in 1951 and received Certificates of Honorable Mention from the National Crushed Stone Association. Including the trophy winner, the ten injury-free operations were worked a total of 1,818,241 man-hours or slightly better than 27 percent of the total work-time of all 42 enrolled plants.

The following plants, excluding the trophy winner, had no disabling injuries: Bell mine Warner Company, Bellefonte, Pa., 327,395 man-hours; Security quarry, North American Cement Corporation, Hagerstown, Md., 172,061 man-hours; LeRoy quarry, The General Crushed Stone Company, LeRoy, N. Y., 124,617 man-hours; Rock Hill quarry, The General Crushed Stone Company, Quakertown, Pa., 92,812 man-hours; Auburn quarry, The General Crushed Stone Company, Auburn, N. Y., 89,873 man-hours; Jordanville quarry, The General Crushed Stone Company, Jordanville, N. Y., 76,039 man-hours; Middlefield No. 1 quarry, The New Haven Trap Rock Company, Middlefield, Conn., 57,299 man-hours; Plainville No. 4 quarry, The New Haven Trap Rock Company, Plainville, Conn., 47,756 man-hours; and McCoy quarry, Warner Company, Bridgeport, Pa., 22,000 man-hours.

The rates of frequency and severity of injuries at the 42 plants enrolled in the 1951 competition were lower than the respective averages for the 26 years of the competition. The frequency rate of 19.182 injuries per million man-hours was the fourth lowest annual rate, 36 percent better than the 26-year average, and a 23-percent improvement compared with the rate of the previous year. The severity rate of 2.515 days lost per thousand man-hours was the second best annual rate, 54 percent lower than the 26-year average, and a 35-percent improvement over the 1950 rate.

A total of 6,620,762 man-hours of worktime was accumlated by the participating plants in the 1951 competition. During this worktime, there were 127 lost-time injuries, the lowest number since 1941. Of this total, one was a fatality, 5 were permanent partials, and 121 were temporary total disabilities. The average disability of the temporary total injuries was 26 days or equal to the corresponding figure in 1950.

Thirty-six open quarries and six underground mines were enrolled in the 1951 competition. The frequency rate of open quarries was 19.297 per 1,000,000 man-hours and the severity rate 2.703 per 1,000 man-hours. The frequency rate, a 29 percent improvement over the 1950 rate, was 35 percent lower than the average rate for the 26 years of the contest. It also was the fourth-best rate in the competition history.

The severity rate of 2.703 was also the fourth-lowest in the same period. This rate was 12 percent less than the 1950 rate and 49 percent lower than the 26-year average.

At the six underground mines enrolled in the 1951 competition the frequency rate of 18.653 per 1,000,000 man-hours was a 24 percent improvement as compared with the preceding year, 42 percent lower than the average for the 26 years, and the seventh-best rate in the history of the competition. The severity rate in 1951 of 1.647 days per 1,000 man-hours of worktime was 81 percent lower than the 1950 rate and a 78 percent improvement over the 26-year average.

Operations in 14 states enrolled in the 1951 competition. New York and Pennsylvania had 10 each, Virginia 6, Connecticut 3, Maryland, Texas, and West Virginia, 2 each, and California, Illinois, Kentucky, Michigan, Oklahoma, Ohio, and Tennessee one each.

Injuries received by personnel at the enrolled plants while handling materials or objects predominated in 1951 with 21 percent of the total. Falls of persons accounted for 17 percent, machinery accidents and falls and slides of rock or materials each injured approximately 12 percent of the total, and 10 percent were injured by falling objects. These five types of accidents accounted for 84 of the 118 injuries with stated causes. The most severe injuries were the result of accidents charged to machinery, falls and slides of rock or materials, haulage, and falls of persons in the order named. Under these four categories, 56 percent of the total time lost through disabling injuries occured. The only fatality during 1951 was at a quarry and resulted from the failure of an employee working in a dust bin to use a safety device which had been provided by the company. He was suffocated when material within the bin covered him.

This annual competition for the promotion of safety in the crushed stone industry is conducted by the U. S. Bureau of Mines under the same rules as the National Safety Competition, and the same records are used in both contests. There are two additional qualifications for the crushed stone competition: that the operation must have commercial production of crushed stone, and that the company be a member of N.C.S.A.

Iraqui Cement Plant Promoters Seek American Technicians

Plans are being made by a group of Iraqui financiers to construct a new cement plant at Mosul, Iraq, which will produce 500-1,000 barrels a day. This group has sufficient capital for carrying out the project but is reportedly seeking technical assistance from an American construction or engineering firm.

Interested persons may obtain further information by writing to the group's agent, Victor N. Bahoshy, P. O. Box 247, Baghdad, Iraq.

According to Norman Hobson, managing director, the Canadian Salt Company, under sponsorship of the Morton Salt Company of Chicago, recently began dry-salt mining at Ojibway, Ontario. This new project was undertaken following a successful drilling program in the important Detroit-Windsor salt district.

Twin-Diesel River Towboat Of Material Service Corp. Christened "Irving Crown"

At ceremonies attended by Chicago city officials, representatives of the U.S. Coast Guard, and U. S. Army Engineers the *Irving Crown*, twin-diesel towboat of the Material Service Corporation was christened on August 28 in Chicago.

Named for Irving Crown, executive vice-president and secretary of Material Service, the 103-ft. craft, said to be the city's most powerful river towboat, was built at a cost of about $500,000 in the Wisconsin yards of the Sturgeon Bay Shipbuilding and Drydock Company. By means of her retractable pilot house the craft can easily negotiate the maze of river branches and canals without necessitating traffic-halting bridge openings.

Present at the christening ceremonies, with Mrs. Betty Sobel "officiating", were Chicago's Mayor Martin Kennelley, Colonel Henry Crown (chairman of the board of Material Service) and Mrs. Crown, and a group of other interested spectators.

The *Irving Crown* has two independently-connected hydraulic steering gears, one for the four flanking rudders, and the other for the two steering rudders. The all-electric-welded steel hull has exceptionally heavy-duty construction, with ½-in. plating on the bow.

• Irving Crown, executive vice-president and secretary of Material Service, on board towboat named in his honor.

• Left to right: L. A. Beaudin, chief, Operations Division, U. S. Corps of Engineers; Col. Henry Crown, chairman of the Board, Material Service Corp.; Capt. G. P. Kenny, officer in charge of Marine Inspection, 9th Coast Guard District; Col. W. P. Trower, division engineer, Great Lakes Division, U. S. Corps of Engineers; Comdr. J. Change, officer in charge of Marine Inspection, Chicago; Col. J. W. Thompson, executive officer to district engineer; Capt. William Hawley, commander Chicago group, U. S. Coast Guard; Robert Crown, vice-president, Material Service Corp.

Despite her power, the craft will pass under all of Chicago's bridges since the pilot house can be lowered from 21 ft. 9 in. above the water to only 13 ft. 9 in. She features two 1,600 hp. Nordberg Supairthermal engines employing the Miller system of supercharging to produce 30 percent more horsepower in limited space. The big towboat reportedly can push eight barges laden with 11,000 tons, and is the sixth in the Material Service fleet.

Springdale Silica Sand Co. Open Plant Near Spokane

A newly organized firm, the Springdale Silica Sand Company, has recently begun producing silica sand at the rate of 100 tons per day at a plant near Springdale, about 35 miles northwest of Spokane, Wash. The enterprise, representing a $150,000 investment, is headed by Frank Eichelberger and J. W. Melrose, Spokane mining men.

Silica sand is obtained from a very localized sandstone deposit, which contains more than 99% silica. From a geological standpoint this deposit is rather unusual in that the Springdale area is part of an extensive lava plateau. The sandstone is quarried by open pit methods. A wagon drill is used for making blast holes, and the broken rock is removed by a power shovel and dragline.

The processing plant is somewhat unique. Based on the principle of gravity flow, the plant is strung out on a hillside, with the machinery standing on a series of excavated steps on the slope. The plant units, from top to bottom, include crushers, scouring and washing machines, dryer, sizing screens, and storage bins with bagging machine underneath.

The owners plan to increase production to 250 tons ultimately. The silica sand is marketed in the Northwest, supplanting in part imported supplies from Illinois, California and Wisconsin.

• Material Service Corporation's new $500,000 towboat, the "Irving Crown," afloat in the Chicago River upon the occasion of her christening.

N.S.G.A. Safety Contest Winners Receive 1951 Trophies, Awards

The Van Sciver plant of the Warner Company, at Tullytown, Pa., the Hudson plant of the Gifford-Hill and Company, Inc., at Hearne, Tex., and plant 7A of the Lyman-Richey Sand and Gravel Corporation, at La Platte, Nebr., were winners in their respective groups of the 1951 National Sand and Gravel Association Safety Competition, conducted by the U. S. Bureau of Mines. In recognition of their outstanding safety records, these operations were awarded symbolic trophies provided by the *Rock Products* magazine. The Association awarded a Certificate of Achievement in Safety to each winning plant and a Certificate of Accomplishment in Safety to each production employee at these plants. Certificates of Achievement in Safety were also given to enrolled operations which were worked 20,000 or more man-hours during 1951 without a lost-time injury.

Plants working over 100,000 man-hours—The Van Sciver plant had the best safety record in this group for having operated 485,977 man-hours without a disabling injury through 1951. This dredge operation has been a participant in 22 of the 23 competitions of the Association, and has won trophies in 1931, 1932, 1933, 1934, 1935, 1939, and 1949. Its 22-year record in safety attests to the co-operation of employees and officials in a well-planned and efficient injury-prevention program. During this period, it established a frequency rate of 6.401 injuries per 1,000,000 man-hours and a severity rate of 1.858 days per 1,000 man-hours of work.

Plants working 50,001-100,000 man-hours—The Hudson plant, winner in this group, had a record of 97,000 man-hours of work without a lost-time injury. This dry pit has been enrolled in the Competition for three years and during this time it has had no disabling injuries, while operating a total of 251,886 man-hours. This is a splendid achievement for a plant in the medium-sized group, and from its record it is evident that each employee and supervisor at the plant has the desire to work with safety uppermost in his mind.

Plants working 50,000 or less man-hours—Plant 7A, a wet-pit operation, had the highest safety honor in this group. The men at this operation worked a total of 44,646 man-hours in 1951 without receiving a disabling injury. This is the second consecutive year that this plant has been injury-free, but because of the contest rules, it was not a trophy winner in 1950.

Injury-Free Plants—Of the 122 participating plants 43 had perfect safety records of no lost-time or disabling injuries throughout 1951. Men at these operations, of which three were trophy winners, worked an aggregate of 2,387,891 man-hours or 27 percent of all hours worked at the competing plants.

The following plants (excluding the trophy winners) were awarded Certificates of Achievement in Safety by the National Sand and Gravel Association. They compiled injury-free records and were worked 20,000 or more man-hours during 1951. In addition, there were 13 injury-free plants which did not receive Certificates because they did not fulfill the minimum requirement of 20,000 or more man-hours of work through the year.

Gifford dry-wet pit plant, Gifford-Hill & Co., Inc., Minden, La., operated 149,808 man-hours

Memphis dredge plant, Marquette Cement Manufacturing Co., Memphis, Tenn., operated 136,750 man-hours

Dredge "Franklin" plant, Warner Co., Tullytown, Pa., operated 122,907 man-hours

Roscoe No. 2 dry pit plant, Consolidated Rock Products Co., Sun Valley, Calif., operated 116,687 man-hours

Quigley wet pit plant, Gravel Mining Co., Hurst, Tex., operated 109,224 man-hours

Phoenix dredge plant, Arizona Sand & Rock Co., Phoenix, Ariz., operated 105,847 man-hours

Centerville No. 106 dry-wet pit plant, Pacific Coast Aggregates, Inc., Centerville, Calif., operated 82,011 man-hours

Whitemarsh wet pit plant, Harry T. Campbell Sons' Corp., Whitemarsh, Md., operated 76,076 man-hours

Snelling Avenue dry pit plant, J. L. Shiely Co., St. Paul, Minn., operated 62,801 man-hours

Nos.12-13-14 dredge plants, Lyman-Richey Sand & Gravel Corp., Fremont, Nebr., operated 56,702 man-hours

Irwindale dry pit plant, Manning Brothers Rock & Sand Co., Irwindale, Calif., operated 55,163 man-hours

Nos. 9 & 11 dredge plants, Lyman-Richey Sand & Gravel Corp., Valley, Nebr., operated 54,678 man-hours

Kingsbury wet pit plant, Gravel Mining Co., Euless, Tex., operated 54,201 man-hours

Boonville No. 1 dry bank plant, Eastern Rock Products, Inc., Boonville, N. Y., operated 39,804 man-hours

Portland dry bank plant, Portland Sand & Gravel Co., Portland, Pa., operated 37,566 man-hours

Akron dry bank plant, The Rubber City Sand & Gravel Co., Akron, Ohio, operated 37,448 man-hours

Rockfield No. 124 wet pit plant, Pacific Coast Aggregates, Inc., Friant, Calif., operated 36,732 man-hours

No. 2A dredge plant, Lyman-Richey Sand & Gravel Corp., La Platte, Nebr., operated 35,518 man-hours

Sierra No. 19 dry pit plant, Consolidated Rock Products Co., Monrovia, Calif., operated 31,787 man-hours

"F" dry bank plant, The Buffalo Slag Co., Inc., Franklinville, N. Y., operated 30,728 man-hours

Stauffer dry pit plant, Utah Sand & Gravel Products Corp., Salt Lake City, Utah, operated 27,431 man-hours

Hollimon wet pit plant, Texas Construction Material Co., Alleyton, Tex., operated 24,750 man-hours

Olympia No. 125 dry pit plant, Pacific Coast Aggregates, Inc., Felton, Calif., operated 37,448 man-hours

Arno dry pit plant, F. M. Reeves & Sons, Inc., Pecos, Tex., operated 21,856 man-hours

No. 15 dredge plant, Lyman-Richey Sand & Gravel Corp., Columbus, Nebr., operated 21,199 man-hours

No. 23 dredge plant, Lyman-Richey Sand & Gravel Corp., Bridgeport, Nebr., operated 20,865 man-hours

South Bend dry bank plant, South Bend Sand & Gravel Corp., South Bend, Ind., operated 20,570 man-hours

A record number of 122 sand and gravel plants was enrolled in the 1951 competition. During a total worktime of nearly 9,000,000 man-hours, the largest volume in the 23-year history of the competition, there were 229 lost-time injuries. For the first year since 1945 the industry did not have a fatality. Of the 229 disabling injuries, 6 were permanent partial disabilities and the remainder temporary total disabilities.

There were 85 bank or pit and 37 dredge operations enrolled in this contest. The injury- frequency at dredge plants was 19.372, which was well below that of 29.772 at banks or pits. The injury-severity rate of 1.254 days lost per 1,000 man-hours of work at dredges was also better than the corresponding rate of 1.531 at banks or pits.

The safety record at all enrolled plants in 1951 was one of the best annual records in the 23 years that the competition has been conducted. The frequency rate of 25.888 and the severity rate of 1.428 were bettered only in three previous times, and both rates were well below the average rates for the history of the competition.

Generally, types of accidents resulting in injuries 1951 followed a pattern established during the previous two years. Falls of persons, machinery accidents, accidents while handling objects, haulage mishaps, and accidents as a result of flying objects accounted for 75 percent of the lost-time injuries in 1951. In 1950 and 1949 these same types of accidents accounted for 67 percent and 62 percent of the total disabling injuries, respectively. The largest volume of time loss in 1951 resulted from machinery accidents with 8,064 days or 64 percent of the total disability loss of 12,629 days. The five predominating types of accidents which accounted for 75 percent of the total injuries were responsible for 92 percent of the total lost-time incurred.

This report outlines the results of the safety contest sponsored by the National Sand and Gravel Association for plants of its membership. Each plant record is compiled from reports submitted in an industry-wide contest which is sponsored and conducted by the Bureau of Mines.

Enrollment applications, rules, and information on the competitions for sand and gravel plants are available upon request from the Accident Analysis Branch, Bureau of Mines, Washington 25, D. C.

Kanamite, a Novel Lightweight Aggregate Developed in Chicago

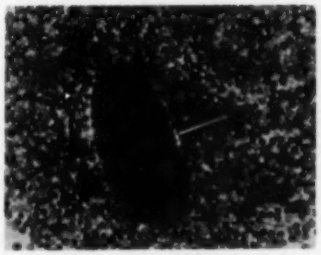
Development of a radically new lightweight construction material was announced in September by the Armour Research Foundation of Illinois Institute of Technology, Chicago. The product, tradenamed "Kanamite", is an expanded non-metallic material consisting of tiny glass-like spheres made from either clay or shale. The spherules, about the size of mortar sand, are produced by burning finely-ground and screened clay in a special furnace; gases given off in the heating process convert the individual clay grains into balloon-like forms. By possessing low density, relatively high compressive strength, and good insulating qualities, Kanamite has potentialities of becoming an important fine aggregate for concrete, mortar, and plaster.

This ceramic product was developed after four years of research by the Armour Foundation under the direction of John M. Neff, assistant chairman of the ceramics and minerals research department. The project was sponsored by the Kanium Corporation, Chicago, whose president, J. D. McLaughlin, was the inventor of this clay product. Two major objectives of the research were to develop a commercially practical method of manufacturing Kanamite and to explore commercial uses for the product.

The first objective has practically been accomplished, according to Mr. Neff. The research program has been carried through an exploratory laboratory phase to the stage of limited pilot plant production and finally to a semi-production stage. A semi-manufacturing plant has been established at the site of a brick plant in Riverdale, a mile south of Chicago's city limits. Although production is small in scale (one furnace unit can produce approximately 750 pounds per hour), it is expected that Kanamite will be marketed on a limited basis shortly.

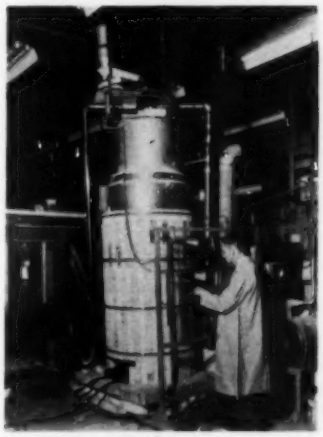
In physical properties, manufacturing process, and performance this novel expanded clay product is very unlike other lightweight aggregates. Physically the material is a uniformly fine-grained, hollow, glassy, unicellular substance; individual particles average .02 inches in diameter (a 30 mesh opening). However, particles can be made ranging in diameter from .0024 to .187 inches (from a 250 mesh to a 4 mesh size). The average wall thickness is .0005 inches. The density varies from 17-25 pounds per cubic foot, depending upon the type of clay and size of clay particles used. Kanamite is a durable, chemically inert substance, completely sealed and non-absorbent. It has unusual strength, generally much higher than such mineral aggregates as pumice, vermiculite, and perlite; the strength has been found to vary with density, grain gradation, and type of raw material. Another important quality is its low thermal conductivity, thus making it a good insulating material (its K value is 0.6).

Kanamite is manufactured by a unique, complicated process, which involves grinding, screening, burning, cooling, and collecting operations. Various clays and shales have been used successfully; generally a clay that makes a good common brick will produce the glassy spherules. Chemically the clay should contain sufficient amounts of basic glass-making materials, more than 3 percent iron oxide, and less than 16 percent calcium and magnesium carbonates.



Enlarged photograph of uniformly sized expanded glass-like spheres. A thumb tack gives indication of size, which in this sample is about a 30 mesh opening.

In the initial stages of manufacturing the raw material is dried, ground to a fine powder by a hammer mill, and screened. The grain size found best suited to the process is passing 35 mesh and retained on 100 mesh. The screened material is conveyed to the top of a special custom-built vertical shaft furnace, having a height of 30 feet and inside diameter of 39 inches. There the material passes into a specially constructed nozzle-type burner which utilizes air and natural gas and is blown into the furnace chamber at the top of the furnace. At a temperature of 2700 degrees F., the individual grains melt in midair and form a glass of such viscosity that pressure developed from gases given off by the clay at the correct instant inflates the particles into hollow spheres. Following the popping stage the glassy balloons fall out of the flame and cool rapidly during the remainder of the fall. The material is then taken by a pneumatic conveyor from the bottom of the furnace to a cyclone collector. Bagging the material is the final operation.



Director of research on Kanamite, John Neff, at one of smaller experimental furnaces.

Perfecting the burning operation required many hours of research. Various size furnaces, burners, and fuels were tried. The main engineering accomplishment involved timing, since the melting and inflating operation, occurring in midair, are practically instantaneous; furthermore the cooling had to occur rapidly in order that the spheres would not collapse.

Various applications of Kanamite have been investigated in the Armour laboratories; the indication is that this clay product has several qualities which may make it an important competitor in the lightweight aggregate field. According to Mr. Neff, concrete, mortar, and plaster made with Kanamite have proved to be both strong and light, besides having good insulating qualities.

Tests on Kanamite-plaster mix revealed a compressive strength of 3220 lbs./sq. in. as compared to 2685 lbs./sq. in. for a conventional sand-plaster mix and 1680 lbs./sq. in. for a perlite-plaster mix. The high strength would allow thinner coating of plaster on walls and the fabrication of lighter and thinner plaster board. Mortar mix made with Kanamite also has good working properties and high compressive strength; water retentivity and strength meet A.S.T.M. specifications. Kanamite concrete mix also has high compressive strength, thus making a lightweight concrete suitable for load-bearing structures.

Another advantageous feature of concrete made with Kanamite is its fluidity; even with water content lower than that of conventional concrete, Kanamite concrete has great enough fluidity so that it can be easily pumped through light rubber hoses. This fluidity, which appears to be imparted to the concrete because of "ball-bearing" action of the spherical clay particles, could result in reduced pumping costs.

Kanamite could also be used in the manufacturing of common or face brick, producing lightweight masonry units of comparatively high strength. Although other uses of Kanamite have not been investigated, Mr. Neff believes that the product can possibly be used in the manufacturing of lightweight refractories, high temperature insulating materials, and foundry sands. In addition, very fine-grained Kanamite (passing 100 mesh) may serve as a filler in plastics.

At Carlsbad, N. M., a few weeks ago a 50-ton carload of potash produced at the International Minerals and Chemical Corporation's plant was sent on its way bearing a proud placard. The sign announced that the shipment was the 100,000th carload of potash to leave the plant since operations began at Carlsbad in 1940.

30 years ago in Pit and Quarry

By WALTER E. TRAUFFER

The October 1922 issue of PIT AND QUARRY featured articles on outstanding nonmetallic minerals operations. There was a complete description of the new quarry and crushing plant of the Lake Shore Stone Products Company near Sandusky, Ohio. This quarry had for some years supplied ballast for a railroad and as a result the new owners inherited a 2½-mile track connecting to three other railroads and to a proposed dock site on Lake Erie. This plant has a capacity of 2500 tons per day.

The No. 30 gyratory primary crusher was in a pit sunk 34 ft. below the quarry floor. Locomotives and cars hauled to this crusher. An elevator fed the crushed rock to a grizzly scalper with oversize going to a No. 49 and undersize to a No. 37 gyratory crusher. Further reduction was by two smaller gyratories which discharged into a 19-ft. deep pit. Another elevator fed to a hopper over a large rotary screen. This discharged into the various compartments of a bin from which cars were loaded. Profitable sidelines were dust, which was sold to cement plants and fine stone which was sold to Chicago mail order houses as chicken grit.

Also described was the gypsum and gypsum products plant of the American Cement Plaster Company near Akron, N. Y. The gypsum was mined and hauled out in cars on an inclined gravity track. Major equipment consisted of a dryer, a hammermill, two roller mills and six burrstones and four calcining kettles. The product was processed into stucco, and blocks, and into board in a modern plant.

The latest addition to the silica sand plants in the Ottawa, Illinois district was that of the Crescent Silica Company. A scraper was used to excavate coarse sand and steam pumps recovered the fine sand. Processing was done in a rotary screen and in 100-ton washer bins and the product was pumped to 16 drain bins which were followed by rotary dryers.

The National Lime Association on September 20 and 21 held a special meeting at the Hotel Sherman in Chicago to discuss proposed promotional plans. The country was divided into three divisions, each to be in charge of a divisional manager. A laboratory service was also to be provided with an enlarged technical staff devoted to construction, chemical and agricultural research work.

A paper presented at the recent National Safety Congress was reprinted. It was "Accident Prevention in the Cement Industry," by H. S. Jacobsen, manager of the Bureau of Accident Prevention and Insurance, Portland Cement Assn. There was also an article on "Storage and Transportation of Portland Cement," by W. M. Myers, assistant mineral technologist, U. S. Bureau of Mines.

Calaveras Cement Completes $2,500,000 Expansion Program

Calaveras Cement Company recently began operating its new fourth kiln at its plant in San Andreas, Calif., thus marking the completion of an expansion and modernization program costing more than $2,500.000. The new kiln will increase plant capacity by about 50 percent, according to H. C. Maginn, executive vice-president and chairman of the management committee. Produced by Moore Dry Dock Co. of Oakland, under sub-contract from Allis-Chalmers Manufacturing Co. of Milwaukee, Wis., the kiln is an exact duplicate of the company's third kiln which was installed in 1946. It is 360 feet long, with a diameter of 11 feet 3 inches.

Related equipment installed with the kiln, also has gone into operation. This includes raw grinding mills, a $250,000 dust collector, a cooler, quarry equipment, and blending and storage silos. Installation of the new equipment was supervised by A. A. Hoffman, Calveras vice-president and consulting engineer.

Marquette Cement Buys New Limestone Reserves in Iowa

Marquette Cement Manufacturing Company recently purchased three parcels of land, totaling 406 acres, in Madison County, Iowa, near Earlham, as a future source of raw materials for the company's cement plant at Des Moines, 30 miles away. The Des Moines plant produces cement for the Marquette subsidiary, Hawkeye-Marquette Cement Company.

Company officials state that this additional property, rich in argillaceous limestone ideally suited to cement manufacture, constitutes a raw materials reserve for the Des Moines plant sufficient to assure approximately 32 years of uninterrupted operation at present capacity. This is in addition to the estimated 35 years' supply remaining at the present source of raw materials.

Situated close to the site of Marquette's present quarry near Earlham, the newly purchased property is directly connected with Des Moines by the main line of the Rock Island Railroad, along which it lies.

Canadian Asbestos Output In 1951 Sets Another Record

Canadian production of chrysotile asbestos established a record in 1951 for the second successive year. The shipment of 967,375 tons of all grades, valued at $78,792,067, represented an increase of 11 percent in volume and 19 percent in value over the figures for 1950. (The greater increase in value is chiefly due to higher prices affecting all fiber groups.)

Output came principally from eastern Quebec and northern Ontario. At Matheson, Ont., the new mine of Canadian Johns-Manville Company, Ltd., completed its first full year of production. Most of the Canadian asbestos output is exported, over 74 percent alone going to the United States.

Turkish cement plants which have announced their goals for increased production are the Sivas plant, which expects to show 200,000 tons this year, the Ankara operation, which will increase output to 65,000 tons, and the new plant at Izmir, which plans to start off with 150,000 tons per year.

42 Sand-Gravel Plants Honored In Mines Bureau Safety Contest

The United States Bureau of Mines has made awards to 42 of the 166 sand and gravel operations enrolled in its second annual safety competition for sand and gravel plants for outstanding safety records in 1951. These plants were classified into two competitive groups—bank or pit and dredge. Of the total enrollment, 118 plants were in the former group and 48 in the latter.

Any bank, pit, or dredge operation working an unconsolidated sand and or gravel deposit is eligible to enroll in the competition. It covers worktime and injuries of all employees at the plant up to the point at which the sand or gravel loses its identity, as in ready-mix plants, or the point at which the producer relinquishes control of the material.

In each group, bank or pit operations and dredge operations, the plants are ranked in order of the injury severity rates or, in cases of no lost-time injuries, in order of the number of man-hours worked. The plant having the best safety record for the year is awarded a Certificate of Achievement in Safety and each man working at the winning plant receives a Certificate of Accomplishment in Safety. A Certificate of Achievement in Safety is also awarded by the Bureau of Mines to each plant that is free of lost-time injuries during the contest, provided that the plant had 20,000 or more man-hours of worktime during the year.

The over-all injury experience for the competition was a frequency rate of 25.583 injuries per 1,000,000 man-hours and a severity rate of 2.341 days lost per 1,000 man-hours of worktime. The frequency and severity rates were more favorable at dredge operations than at bank or pit operations.

Bank or Pit Group—The Gifford plant of the Gifford-Hill and Company, Inc., at Minden, La., won top safety honors in this group for having a perfect safety record of no disabling injuries during 149,808 man-hours of worktime. The frequency rate at this plant in 1950 was 8.083 injuries per 1,000,000 man-hours of exposure. In addition to this winning plant, there were 48 other bank or pit operations which were worked during the year without a lost-time injury.

Dredge Group—The Van Sciver dredge operation of the Warner Company at Tullytown, Pa., had the best safety record in this group in 1951. This plant was operated a total of 485,977 man-hours without having a lost-time injury. In 1950 this plant had a frequency rate of 2.228 injuries per 1,000,000 man-hours of exposure. In addition to this operation there were 20 others that had no disabling injuries charged against them.

In addition to this industry-wide contest, the National Sand and Gravel Association sponsors a competition for plants of its members. This competition is also conducted by the Bureau of Mines. The results are computed from vital statistics submitted by participating plants. The Association competition is divided into three groups: (1) those working more than 100,000 man-hours; (2) those working 50,001-100,000 man-hours; and (3) those working 50,000 or less man-hours. The winner in each group is awarded a symbolic trophy.

Enrollment applications, rules, and information on the competitions are available upon request from the Accident Analysis Branch, Bureau of Mines, Washington 25, D. C.

Injury-Free Operations—Employees and officials at 70 of the 166 sand-and-gravel operations competing in the 1951 contest had the outstanding safety performance of working free of lost-time injuries throughout the year. Men at these 70 plants, of which two were trophy winners, worked 3,264,136 man-hours or 30 percent of the 10,827,501 man-hours worked at all the enrolled plants. This achievement at any plant attests to the cooperation of employees and supervisors in well-organized and efficient safety programs.

The following plants, excluding the two trophy winners, had no lost-time injuries during 1951. All injury-free plants with 20,000 or more man-hours of worktime were awarded Certificates of Achievement in Safety by the Bureau of Mines.

Greer dredge, Grand Prairie Construction Co., Turkey Creek, La., 224,018 man-hours

Memphis dredge, Marquette Cement Manufacturing Co., Memphis, Tenn., 136,750 man-hours

Dredge "Franklin", Warner Co., Tullytown, Pa., 122,907 man-hours

Roscoe No. 2 dry pit, Consolidated Rock Products Co., Sun Valley, Calif., 116,687 man-hours

Quigley wet pit Gravel Mining Co., Hurst, Tex., 109,224 man-hours

Phoenix dredge, Arizona Sand & Rock Co., Phoenix, Ariz., 105,847 man-hours

Hudson dry wet pit, Gifford-Hill & Co., Inc., Hearne, Tex., 97,000 man-hours

Crystal City pit, Pittsburgh Plate Glass Co., Crystal City, Mo., 84,547 man-hours

Centerville No. 106 dry-wet pit, Pacific Coast Aggregates, Inc., Centerville, Calif., 82,011 man-hours

Herndon No. 1 dry-bank pit, Herndon Rock Products Co., Herndon, Calif., 76,227 man-hours

Whitemarsh wetpit, Harry T. Campbell Sons' Corp., Whitemarsh, Md., 76,076 man-hours

Milwaukie dry bank, Portland Road & Driveway Co., Milwaukie, Oreg., 70,124 man-hours

Snelling Avenue dry pit, J. L. Shiely Co., St. Paul, Minn., 62,801 man-hours

No. 12-13-14 dredge, Lyman-Richey Sand & Gravel Corp., Fremont, Nebr., 56,702 man-hours

Irwindale dry pit, Manning Brothers Rock & Sand Co., Irwindale, Calif., 55,163 man-hours

No. 9-11 dredge Lyman-Richey Sand & Gravel Corp., Valley, Nebr., 54,678 man-hours

Kingsbury wet pit, Gravel Mining Co., Euless, Tex., 54,201 man-hours

No. 7A dredge, Lyman-Richey Sand & Gravel Corp., La Platte, Nebr., 44,646 man-hours

Boonville No. 1 dry bank, Eastern Rock Products, Inc., Boonville, N. Y., 39,804 man-hours

Dresden dry bank, Zanesville Gravel Co., Dresden, Ohio, 37,678 man-hours

Portland dry bank, Portland Sand & Gravel Co., Portland, Pa., 37,566 man-hours

Akron dry bank, The Rubber City Sand & Gravel Co., Akron, Ohio, 37,448 man-hours

Geauga dry bank, Industrial Silica Corp., Geauga Lake, Ohio, 37,141 man-hours

Rockfield No. 124 wet pit, Pacific Coast Aggregates, Inc., Friant, Calif., 36,732 man-hours

No. 2A dredge, Lyman-Richey Sand & Gravel Corp., La Platte, Nebr. 35,518 man-hours

Sierra No. 19 dry pit, Consolidated Rock Products Co., Monrovia, Calif., 31,787 man-hours

Steilacoom dry bank, Glacier Sand & Gravel Co., Steilacoom, Pierce County, Wash., 31,699 man-hours

"F" dry bank, The Buffalo Slag Co., Inc., Franklinville, N. Y., 30,728 man-hours

Ludlow Falls dredge, Steiner's Sand & Gravel Co., Ludlow Falls, Ohio, 30,407 man-hours

Stauffer dry pit, Utah Sand & Gravel Products Corp., Salt Lake City, Utah, 27,431 man-hours

Hollimon wet pit, Texas Construction Material Co., Alleyton, Tex., 24,750 man-hours

Olympia No. 125 dry pit, Pacific Coast Aggregates, Inc., Felton, Calif., 24,636 man-hours

Winona dredge, The Winona Sand & Gravel Co., Winona, Minn., 23,742 man-hours

Arno dry pit, F. M. Reeves & Sons, Inc., Pecos, Tex., 21,856 man-hours

No. 15 dredge, Lyman-Richey Sand & Gravel Corp., Columbus, Nebr., 21,199 man-hours

Lebanon wet pit, Lebanon Sand & Gravel Co., Lebanon, Oreg., 21,017 man-hours

No. 23 dredge, Lyman-Richey Sand & Gravel Corp., Bridgeport, Nebr., 20,865 man-hours

Wilton dry pit, Hudson Valley Sand & Stone Co., Wilton, N. Y., 20,571 man-hours

South Bend dry bank, South Bend Sand & Gravel Corp., South Bend, Ind., 20,570 man-hours

Starbrick dredge, General Concrete products Corp., Warren, Pa., 20,510 man-hours

Elkhart Lake dry bank, Crystal Lake Crushed Stone Co., Elkhart Lake, Wis., 18,813 man-hours

Bethel bank-pit, Bernard J. Dolan Co., Bethel, Conn., 18,792 man-hours

Mackinaw dry pit, McGrath Sand & Gravel Co., Mackinaw, Ill., 18,208 man-hours

Trenton No. 2 wet pit, Eastern Rock

(*Continued on page* 109)

WASHINGTON NEWS LETTER

By S. HERBERT UNTERBERGER

THE Federal Reserve Board has been taking a very careful look at the 1952 real estate market. Although their findings are not startling they should be of importance to every business which relies, in whole or in part, on construction and real estate activities. On the whole, their conclusions are optimistic.

Here is a summary of their findings:

1. The dollar volume of new construction in the first seven months of 1952 set a new high record. Because most of the increase represented higher construction costs, the physical volume of new construction was just about the same as the previous year.
2. Public construction showed the largest increase, particularly defense work and atomic energy plants, but expenditures for highways and public housing increased one-seventh and one-half respectively.
3. Private business construction has not increased since last year.
4. Private residential construction in the first half of 1952 was 7 percent less than in the first half of 1951 but 9 percent greater than in the second half.
5. New houses completed and sold in the first half of this year numbered 400,000—down from 500,000 in each half of last year and 650,000 in the last half of 1950.
6. Extension of home mortgage credit continues in large volume —about 8 billion dollars every 6 months.

In addition to reporting on current developments in the real estate and construction fields, the Federal Reserve Board also has taken a look into the future. As part of its annual survey of consumer finances, it has secured information not only on what families did with respect to home buying in the past but also with respect to their home buying plans. In this study they arrived at the following conclusions:

1. About 700,000 purchasers bought new homes in 1951 and 1,700,000 bought existing homes.
2. The average price paid was about $9,000—24 percent paid under $5,000; 15 percent paid $5,000 to $7,500; 22 percent paid $7,500 to $10,000 and 37 percent paid $10,000 and over.
3. A larger proportion of purchasers in 1951 than in 1950 borrowed to finance their house purchases—84 percent in 1950, 89 percent in 1951. About 4 in 10 purchasers in 1951 borrowed 80 percent or more of the price of the house and 2 in 10 borrowed from 60 to 80 percent.
4. About the same proportion of consumers in early 1952 expressed plans to purchase houses during the coming year as had such plans at the beginning of 1951. In both years, approximately 4 percent of all non-farm families expected to buy a house.
5. These buyers expected to pay more for their houses in 1952 than in 1951. The average price which they expected to pay was $9,800.
6. Half the prospective buyers were veterans.
7. Almost 70 percent of the prospective buyers had incomes of $4,000 a year or more.
8. About 4 in 10 prospective buyers already owned homes.

The net effect of the various Federal Reserve Board analyses appears to be that the real estate and construction market is likely to continue strong although not at the post-Korean boom level.

* * *

The surprise story of the month to come out of Washington originated in the Labor Department. It read as follows:

> "Preliminary results of the Bureau's (Bureau of Labor Statistics') Survey of Consumer Expenditure in 1950 show that urban family money income, after payment of personal taxes, averaged about $4,300. . . Total average outlay amounted to about $4,700."

This story was headlined around the country as proof that, as a nation, we are living beyond our incomes.

This study was made by the Bureau of Labor Statistics for the purpose of getting up-to-date information on the pattern of consumer expenditures to be used in connection with the revision of Consumer Price (Cost-of-Living) Index. To determine changes in the cost-of-living the Bureau of Labor Statistics each month prices a standard selection of commodities which the average consumer buys. To determine what those commodities are and their relative importance, the Bureau of Labor Statistics interviewers knocked at the doors of 15,180 dwellings in 91 cities which were selected by approved statistical sampling techniques so that the sample of dwellings was random and representative of all private living quarters in each city.

When the data were compiled this very unexpected result turned up. It caused consternation in many quarters in Washington, particularly since it appeared to conflict with the findings of other government agencies. The Department of Commerce, for example, which compiles a great deal of data on national income and expenditures had been reporting that personal savings were rising at an unprecedented rate. How, as a nation, we could be living beyond our incomes and still saving more than before is an inconsistency that demanded explanation. Several explanations have been made. None of them are fully satisfactory.

To begin with, each of the departments have arrived at their results on the basis of less than fully complete and perfect information. Neither the Labor nor Commerce Department has investigated the consumption and savings pattern of every American family. Because of budget, time, and other limitations, the Labor Department relied on sampling methods while the Commerce Department applied analytic methods to available statistical data.

One of the likeliest explanations is that the Labor Department's sample included a very high representation of low and moderate income wage earners who are more likely to spend their earnings at least as rapidly as they make them. The conclusion that in 1950 their expenditures exceeded their earnings may be completely valid for that group. On the other hand, the Commerce Department's data is likely to represent somewhat higher income groups who have been known to do most of the nation's saving. The conclusion that there was a savings increase over previous years may be equally valid for that group.

(*Continued on page* 81)

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Centennial of Engineering Celebrated in Chicago—A.I.M.E. Holds Midyear Meeting

By KENNETH A. GUTSCHICK

THE Centennial of Engineering, the greatest engineering gathering ever held, was staged in Chicago Sept. 3-13. The purpose of the Centennial was to commemorate the one-hundredth anniversary of the founding of the nation's first engineering society, the American Society of Civil Engineers. Participating in this well organized convocation were 65 national and international engineering societies or groups, as well as numerous large foreign delegations. More than 30,000 of the world's leading engineers and scientists attended. All engineering professions were represented, including civil, mining, mechanical, electrical, military, and hosts of others. Major societies participating included the American Society of Civil Engineers, American Institute of Mining and Metallurgical Engineers, American Concrete Institute, Armour Research Foundation, American Society for Testing Materials, and many others. Foreign representatives, numbering over 500, came from 33 nations of western Europe, South America, Africa, and the Far East.

The numerous engineering societies met in more than 200 separate sessions in Chicago's leading hotels and other meeting places. At these specialized sessions more than 900 technical papers, representing fields ranging from civil engineering through rocket travel to industrial management, were presented; these papers generally followed the theme of the Centennial by stressing the engineer's contributions during the past century of progress. In addition, panel discussions were undertaken by several groups.

Apart from the technical sessions mentioned above, the Centennial program included a very comprehensive symposium, designed to serve the public by featuring discussions on general topics. Broad subjects covered included The Role of the Organized Profession, Education, Foods, Tools, Transportation, Mineral Industries, Construction, Chemical Industries, Communications, Energy, Health, and Urbanization. More than 90 speeches were made by distinguished leaders in various fields.

Special features of the Centennial, designed for both the visiting engineer and the public, included a large Centennial of Engineering exhibit, a stage production called "Adam to Atom," a motion picture entitled "Miracles for Millions," and several field trips. The exhibit, located at the Museum of Science and Industry, gave a cross-section of the engineer's role in modern civilization. A variety of well-integrated displays revealed engineering achievements. The stage play, also presented at the museum, was a musical review produced in 25 scenes portraying man's cultural and technological advances throughout history. The motion picture, a 30-minute color film relating the story of America's engineering progress, was made available for distribution throughout the U. S. Field trips sponsored by the Centennial included visits to the modern Portland Cement Association research laboratory in Skokie, a new Commonwealth Edison power plant in Stickney, a modern sewage treatment works, and an Inland Steel Company steel plant. In addition, special tours were made through Chicago.

Two special days marked the Centennial, including International Day, Sept. 3, and Centennial Day, Sept. 10. The first holiday was set aside to honor foreign delegates attending the meeting; a reception was given at the Museum of Science and Industry. A special feature of the day was the laying of a cornerstone of the museum; unlike other cornerstones, this one contained a helium-filled metal box housed in at one-ton granite block. The box, containing various biological, chemical, and physical materials, is not to be opened for 100 years, after which time scientific studies will be made of the changes occurring in enclosed substances.

Centennial Day featured an address by Herbert Hoover and the presentation of two of the highest awards conferred in the engineering profession. The Hoover Medal was presented by Mr. Hoover to the Rt. Hon. Clarence D. Howe, Minister of Trade and Commerce and Defense production in Canada, for his outstanding public service. The John Fritz Medal was presented to Benjamin Franklin Fairless, president of U. S. Steel Corporation, for his outstanding contributions in the industrial field. The Centennial Day celebration was concluded with an address by Charles F. Kettering of General Motors on the subject "A Review of the Century."

A.I.M.E. field group at silica sand plant being briefed by J. E. Lamar, geologist, Ill. Geological Survey (extreme left). Next three men on Lamar's left are: E. Bonkoff, Toronto; M. M. Leighton, Chief, Ill. Geological Survey, and A. D. Bryant, Standard Silica Corp.

A.I.M.E. MEETING

One of the 65 societies collaborating with the Centennial of Engineering was the American Institute of Mining and Metallurgical Engineers, which held its 174th General Midyear Meeting Sept. 3-6 at the Palmer House in Chicago. The four day affair consisted of the usual field trips, presentations of technical papers, luncheons, and committee meetings.

Field Trips The meeting began with an afternoon field trip to the famous dunes region of northwestern Indiana; it was sponsored by the Indiana Geological Survey and led by Ned Smith of the survey. Visits were made to three bank sand operations, where dune and former beach sand deposits were dug with diesel cranes and loaded into railroad cars. The primary use of the sand is for fill; minor uses include molding, core, asphalt paving, plaster mortar, engine, and glass sand.

On the following day the Illinois Geological Survey, with J. E. Lamar in charge, conducted a field trip 90 miles southwest of Chicago to the Standard Silica Corporation's plant at Ottawa and to the Illinois Clay Products Company's plant at Goose Lake near Joliet. The silica sand operation, one of several in the Ottawa district, utilizes both open pit hydraulic mining and underground hydraulic mining for recovering the crude silica sand. Application of the latter method is new to the industry, having recently been developed by A. D. Bryant, Vice-president of Standard Silica Corp. After observing quarrying operations, the field party visited the mill where elaborate washing, drying, grinding, and screening operations produced several grades of industrial sand, with products ranging from coarse sand blast to finely ground silica flour. The plant featured two hydroseparators for removing clay from the silica, steam coil dryers, the exclusive use of pebble mills for grinding, and 70 electrically-driven 3 by 5-ft. vibrating screens. Details of the quarrying process will be presented later in the article.

The manufacturing of several refractory fire clay products was observed at the large modern Illinois Clay Products plant; these products included ground fire clay and flour, fire clay brick, a chemically bonded (not kiln-fired) brick, and a high temperature insulating material made from vermiculite. In addition, this plant produced a small amount of a rare bonding clay called grundite. All of the products were designed for metallurgical purposes and used by Chicago area and Detroit steel producers. The brick, manufactured by the dry-press method and de-aired, were burned in beehive and circular tunnel kilns.

General view of Standard Silica Corp. plant at Ottawa, Ill. Large building in center is used for screening; building on left for washing and drying silica sand.

Industrial Minerals Session The remainder of the A.I.M.E. meeting was devoted to technical sessions, where 46 papers were presented in the fields of minerals benificiation, industrial minerals, groundwater, geology, iron and steel, and coal. Brief reports of the industrial minerals section follow.

The morning session, featuring Advances in Industrial Minerals, began with a paper entitled *Trends in Great Lakes Bulk Transportation of Nonmetallic Minerals* by Oliver T. Burnham, Secretary, Lake Carrier's Association. Mr. Burnham discussed major trade routes, methods of loading and unloading boats, trends in movements of bulk cargoes, and future trends. He pointed out the importance of Great Lakes shipping by indicating that in industrial commerce it ranked second to railroads, handling 206 million tons of cargo in 1951. Although major commodities included iron ore, coal, grain, and petroleum products, nonmetallic materials like limestone, gypsum, cement, sand and gravel, and sulphur were of considerable importance.

A. D. Bryant, vice-president, Standard Silica Corporation, Ottawa, Ill.

Limestone is the major nonmetallic material shipped via the Great Lakes; shipments comprise 18 percent of all limestone produced in the U. S. The bulk of the limestone trade is between large quarries of the Straits of Mackinac district and major ports like Chicago, Detroit, and Cleveland; the limestone is used principally as flux in iron ore smelting and in lime and cement production. Self unloading bulk freighters are primarily used; normal unloading rates average 2,000 tons per hour.

Bulk cement shipments, begun in 1916, are handled by specially constructed vessels used exclusively in the cement trade; they possess their own discharge equipment. Although screw conveyors are used to some extent in loading and unloading, greater reliance is being placed on use of air pressure.

Gypsum, produced at a U. S. Gypsum quarry at Alabaster, Mich., moves to the East Chicago and Detroit plants. The loading operation

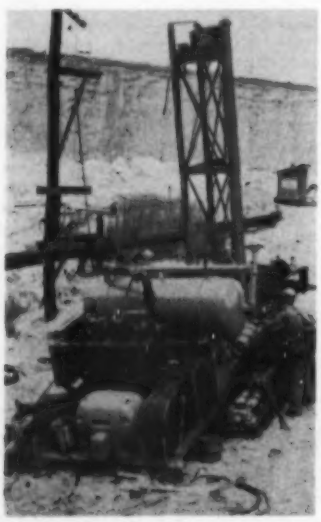
High-pressure nozzle directed on recently-blasted sandstone talus.

at Alabaster is most unusual due to lack of a natural harbor. A dock 1.3 miles offshore was constructed; overhead bucket tramways transfer the gyprock from shore to the dock-site.

The sand and gravel trade is largely accounted for by lake sand producers who dredge offshore deposits or by producers who mine shoreline deposits, generally at river mouth locations. Chicago serves as a transfer point for the Great Lake sulphur trade; the material is barged into Chicago via the Mississippi River and the Illinois Waterway and then transferred to vessels through use of cranes. Slag and cinders are minor materials shipped via the Great Lakes.

Mr. Burnham concluded by pointing out that the current major trends involve the construction of larger vessels and improved loading and unloading facilities.

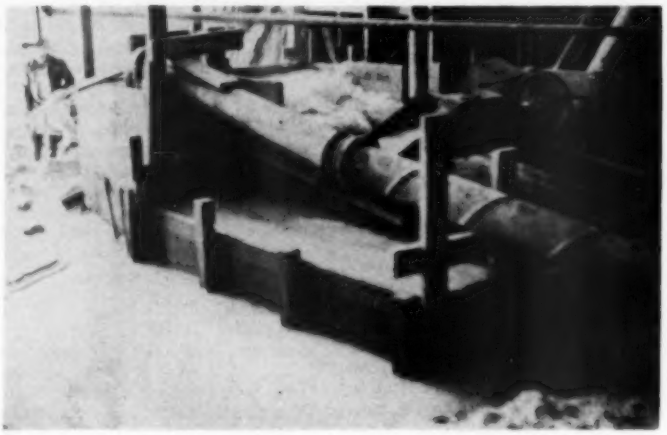
A paper presented by Walter H. Voskuil, Mineral Economist, Illinois State Geological Survey, dealt with *Fuels Used in the Chicago Area.* The author emphasized the importance of the Chicago Industrial area in coal consumption by stating that the Chicago market uses 5 percent of all coal and 17 percent of all coke used in manufacturing in the U. S. Several slides showing production statistics and source areas of coal for Chicago were shown. Coking coals are largely imported from various Appalachian fields, particularly the eastern Kentucky and western West Virginia districts. The bulk of industrial coal comes from the nearby southern Illinois, Indiana, and western Kentucky fields. Mr. Voskuil briefly mentioned the use of oil and natural gas in Chicago, pointing out that these products represent only 20 percent of all fuels used in Chicago.



Improvized Jumbo used in drilling underground blast holes.

Underground Mining of Silica Sand by Hydraulic Methods by A. D. Bryant, Vice-president, Standard Silica Corporation, Ottawa, Ill., gave an interesting account of two mining methods used at the Standard plant, namely, the older open pit method and the newer underground method. The former method consists of applying a high pressure stream of water (about 175 pounds pressure) over recently blasted St. Peter sandstone talus piles in the pit; the "eroded" sand drains into a sump, where it is picked up by a sand ejector or hydraulic elevator. It then passes over a small shaker screen (No. 4 mesh) and the fines are pumped out of the quarry to the washing plant through more than 2,000 feet of rubber lined pipe.

The newer underground operation was patterned from similar silica sand mines in Missouri and Arkansas, which were operated by the room and pillar method. The basic departure used here is to apply the high pressure water stream in the underground rooms instead of using power shovels and trucks. The general practice is to make the rooms 30 feet wide and 25 feet high. Drilling horizontal blast holes is accomplished by an improvized Jumbo, which is placed on crawler treads and has three air drills mounted on a hydraulic platform. Fifty-two holes, each 12 feet deep, are drilled for one blast. Following blasting, the fractured silica sand is washed out by the hydraulic hose and pumped to the washing plant in an operation identical to that used in the open pit method.



Shaker screen used in underground hydraulic silica mine. Sand is lifted from sump to screen by ejector. Following screening sand is pumped to mill.

After thoroughly explaining this new underground method, Mr. Bryant discussed its merits and disadvantages. He also discussed the pros and cons of various pipes used for conducting the silica from the pit to the plant.

The afternoon session, featuring five papers on Advances in Building Materials, began with *Engineering Research in Structural Clay Products* by Paul V. Johnson, Structural Clay Products Research Foundation. The author briefly discussed the organization and growth of the foundation, pointing out that the group was organized in 1949 as a competitive endeavor by more than 125 structural clay manufacturers in the U. S. and Canada. The main objective was to stimulate the market

for brick and tile, which had been constantly declining due mainly to expanding uses of competitive products. Research for the most part has been directed toward new and better uses for clay products, rather than on improvements in the manufacturing process. Three engineering projects were considered, including the development of a new insulated masonry wall, a new theory of multiple story construction in which the structural masonry is within the building rather than in the exterior walls, and the development of a jumbo-sized face brick. This latter product, a 2⅔ by 6 by 12 inches in size, was designed to reduce the cost of residential construction.

Two important papers were given the newly developed lightweight aggregate field. *Development and Use of Lightweight Aggregates* by Albert Litvin, Supervisor, Masonry Materials Research, Armour Research Foundation, dealt generally with the entire lightweight aggregate group of materials. The author discussed three categories, including natural aggregates like scoria and pumice; by-product aggregates like cinders and slag; and manufactured aggregates like expanded shale and clays, expanded slag, expanded perlite, and expanded mica (vermiculite). The third group comprises the largest amounts of lightweight materials used today. Mr. Litvin traced the growth of the various lightweight products industries and enumerated the great number of uses for their products. Principal uses include lightweight concrete and precast concrete units. The author also considered the principles involved in the formation of the manufactured aggregates.

A more specific paper was presented by William R. Jackson, Consulting Engineer, Silbrico Corporation on *Ultra Lightweight Aggregates in the Chicago Area*, which was concerned with only those aggregates weighing less than 12 pounds per cubic foot. Air was mentioned as one such substance; although technically not an aggregate, nevertheless air-entraining agents will considerably lighten concrete and plaster. Vermiculite, a leading expanded aggregate, generally sold under the trade name of Zonolite and others, is produced by two manufacturers in the Chicago area. It is principally used as a plaster aggregate, possessing good fire-proofing qualities; however, mason contractors use it to some extent. The major lightweight aggregate used in the Chicago area is perlite. Starting

M. L. Haider, president of A.I.M.E.

with one plant in 1949, there are now five plants in the Chicago area manufacturing perlite. Ninety-five percent of the product is used in plastering and only 5 percent in concrete masonry. A stimulus to the rapid growth of the local perlite industry has been the development of a gypsum-perlite ready-mix product by a gypsum plaster producer. Mr. Jackson estimated that the total perlite sales in 1951 in the Chicago area amounted to $1,000,000.

A paper was also presented in the heavy aggregate field, namely, *Developments in Aggregate Production* by S. T. Harrison, Chief Engineer, J. L. Shiely Company, Inc., St. Paul, Minn. The author showed slides and motion pictures of several sand and gravel operations in North Dakota and Montana that he helped develop. He pointed out changes in the sand and gravel industry over the past 20 years. Two major changes emphasized were increase in production through use of more efficient machinery and equipment and the production of more uniform products due to the tightening up of specifications, especially government. One movie revealed all phases in the operation of a large-scale sand and gravel plant located at the Garrison Dam project in North Dakota. At the conclusion of the paper, Mr. Harrison briefly discussed numerous problems of the sand and gravel industry.

The concluding paper, in the field of economic geography, entitled *Nonmetallic Mineral Building Material Industries of Metropolitan Chicago* by Kenneth A. Gutschick, formerly of Material Service Corporation and now Field Editor, PIT AND QUARRY, was of general interest since it gave an overall picture of the diversity of mineral industries concentrated in the Chicago area. The author discussed three groups of local industries, including quarrying, manufacturing, and trade. The quarrying group, located at a raw material site, included crushed dolomite, common brick, sand and gravel, and building stone; the manufacturing group, located nearer to the market than to a raw material site, included cement, concrete products, lime, gypsum products, ready-mixed mortar, and cut stone; the trade group, non-productive in nature and wholly market-oriented, included general building material, face brick, and building stone yards.

Mr. Gutschick pointed out that these industries are of outstanding importance, supplying nearly the entire Chicago area building material market. The quarrying and manufacturing industries, consisting of more than 150 establishments, supply the entire market with crushed stone, common brick, and concrete products like block, pipe, pre-cast slabs and tile, and ready-mixed concrete. There is also large local production of sand and gravel, gypsum products, lime (both hi-cal and dolomitic), and cut stone; however, other midwestern producers serve the Chicago area to a certain extent. The only materials not produced locally are face brick and sewer pipe; these products are imported from central Illinois and from nearby states. A third major imported commodity is building stone; local production of a veneer stone is on an extremely small-scale.

The trade industry, although non-productive in nature, performs a major function by dealing in a complete line of "hard" materials. Approximately 300 yards, dealing in general building materials or face brick or building stone comprise the third industry.

Indicative of the great local production, particularly of the quarrying industries, is the fact that Metropolitan Chicago accounts for 75 percent of Illinois and 5 percent of U. S. common brick production, 40 percent of Illinois crushed limestone and dolomite production, and 20 percent of Illinois sand and gravel production. Yearly local production of crushed stone amounts to 6 million tons; of sand and gravel, 3.5 million tons, and of common brick, 300 million units. The manufacturing industries also produce vast amounts of materials, although pro-

duction figures were not given. Thus the author pointed out that the Chicago area stands out as a major building material center.

State Geologists Session An important technical session of the A.I.M.E., held Sept. 6, dealt with Activities of the State Geological Surveys and featured papers given by state geologists from Minnesota, Michigan, Illinois, Indiana, Ohio, and Wisconsin. In addition, Harold Bannerman, Chief, Division of Economic Geology, U. S. Geological Survey, spoke on activities of the U.S.G.S. in the Great Lakes region. The geologists told of numerous field and laboratory activities of their surveys, which are designed to further the knowledge of each state's mineral resources. They pointed out that the major aim of the surveys was to aid producers and consumers of mineral products by making this knowledge available.

M. M. Leighton, Chief of the Illinois State Geological Survey, told of research activities carried on in coal, oil and gas, clay, rock and rock products, fluorspar, lead and zinc, groundwater, and geophysics. Regarding rock products, Dr. Leighton pointed out that in 1951 more than 200 plants produced rock products like limestone, cement, silica sand, and sand and gravel valued at more than $52,000,000. Detailed studies are being made of sand and gravel resources of the state, building materials and silica sand of southern Illinois, physical-chemical nature of limestone and dolomite, particularly for their use as agstone, and heavy minerals of Illinois sands. Research is also being furthered on the vast fluorspar deposits of southern Illinois, particularly in the location of new deposits and the development of new chemical fluorine compounds.

Activities of the Indiana Geological Survey were related by State Geologist Charles F. Deiss. A survey of state sand and gravel resources has been completed and an important bulletin on industrial sands of the Indiana dunes has just been published. Dr. Deiss also mentioned a recent publication dealing with a survey of Indiana's crushed limestone industry.

John H. Melvin, Chief of the Ohio Geological Survey, also told of a variety of projects being undertaken now. Of particular interest was a study of limestones of eastern Ohio just completed; this was a comparative study to an earlier report on limestones of western Ohio. Dr. Melvin also mentioned the recent publication of a minerals industry map of Ohio.

E. F. Bean, State Geologist, Wisconsin Geological and Natural History Survey, pointed out that although Wisconsin is not an important mineral producing state, ranking 33rd in the U. S., nevertheless the survey is very active in research work. One major activity, having been carried on for the past 33 years, concerns road material investigations. Detailed geological surveys of road materials in territory adjacent to proposed highway construction projects are made. Recommendations are then given to government highway engineers for the development of certain suitable deposits.

A.I.M.E. Business Meeting At a combined luncheon-business meeting of the Industrial Minerals Division of A.I.M.E. on Sept. 5, Robert C. Stephenson, chairman of the fall meeting committee, presided and introduced several notable members of A.I.M.E. Included were M. L. Haider, newly elected president; Sanford S. Cole, vice-chairman on Papers and Program Committee of this meeting; Charles M. Cooley, newly elected secretary, Mining Branch; Harold Bannerman, incoming chairman of the 1953 meeting; G. H. Waterman, Western vice-chairman; and Edward H. Robey, secretary and recently placed in charge of the 1953 midyear meeting in Nova Scotia. Plans for the coming annual meeting in Los Angeles next February and the Nova Scotia meeting next summer were discussed. Ian Campbell, 1952 chairman, was unable to attend.

Centennial Symposium Apart from the A.I.M.E. technical meeting, the Symposium program of the Centennial of Engineering featured a group of talks on Mineral Industries, held at the Sherman Hotel on Sept. 8-9. Eleven distinguished leaders in the minerals field presented papers on metals, fuels, and nonmetallic minerals. Each speaker stressed contributions made by engineers to the mineral industries.

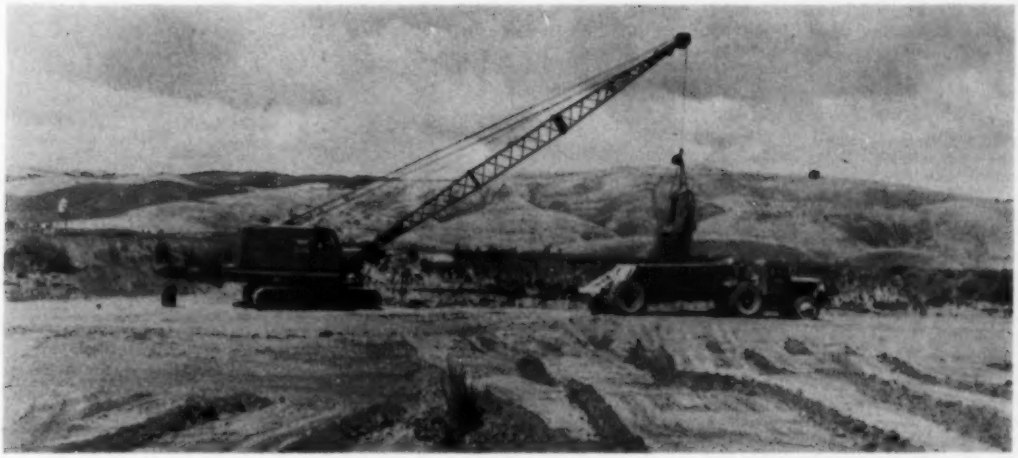
Of particular interest was a talk entitled *Nonmetallic Minerals* by John D. Sullivan, Assistant Director, Battelle Memorial Institute. The aim of the paper was to emphasize the important role played by nonmetallic minerals in the national economy. To do this Mr. Sullivan compared the production of steel, the backbone of our metal economy, with that of various nonmetallic minerals. In 1951 production of these materials in millions of net tons was as follows: steel 105, sand and gravel 370, concrete 310, cement 44, structural clay products 24, glass 6.5, phosphate rock 11.5, potash 1.4, sulphur 5.8, and salt 15.6. The author also included graphs showing production of the above mentioned products for the past 30 year period; the status of those materials remained essentially the same over that span. The body of the report was encyclopedic in nature; numerous nonmetallic minerals were discussed from the standpoint of their uses, both old and new and in production trends. Construction materials, lime, refractories, salt, sulphur, phosphate, fluorspar, and asbestos were some of the materials discussed. Regarding the construction materials, Mr. Sullivan emphasized advances made in pre-stressed concrete and in lightweight aggregates, particularly perlite and vermiculite. A graph of demand for lime revealed that shipments more than tripled in the past 20 years, rising to more than 7,000,000 tons in 1950.

A recent trend in the basic refractory field is the development of refractory products from chromite and magnesite rather than fireclay.

In conclusion Mr. Sullivan stated that nonmetallic minerals would play an even more important role in our future economy than they do today.

Another symposium report of interest was presented by Donald H. McLaughlin, President, Homestake Mining Company on the subject *Exploitation of Mineral Resources.* The talk dealt with the role of the mining engineer in the discovery and recovery of mineral deposits. Although the author primarily treated the mining of metals, particularly gold, copper, and iron, he touched on subjects of interest to nonmetallic mineral producers. He stressed the great responsibility placed on the mining engineer for the wise exploitation of the world's mineral resources and for making the mineral products available with a minimum of waste. In tracing the development of the mineral industries to its present high level of efficiency, Mr. McLaughlin brought out the integrated roles played by diversified groups of engineers and scientists.

Carolina Cement and Lime Company has received approval from the D.P.A. for the construction of a $4,643,000 Portland cement plant.



The dragline loading haulage unit in the pit of Rhodes and Jamieson, Ltd., at Centerville, Calif. Good material without adverse water conditions is to be found to a depth of 60 ft.

240-T.P.H. Sand and Gravel Plant Built by California Ready-Mixed Concrete Producer

anything ON THE SPOT removed

WHEN Rhodes & Jamieson, Ltd., of Oakland, Calif., enlarged the scope of its ready-mix operations two or three years ago, following the erection of another batch plant in suburban San Lorenzo, its aggregate requirements rose to about 900 tons daily. Guarantee of a constant and uninterrupted supply, as well as simple economics, thus dictated the necessity of establishing its own aggregate-producing plant. In seeking to design, erect, and operate such facilities, the concern was fortunate in enlisting the services of D. A. Gildersleeve.

By HARRY F. UTLEY

Identified with the operation and management of outstanding sand-and-gravel plants in the East Bay area for nearly a quarter century, Mr. Gildersleeve was given wide latitude in planning and locating the new plant, which went into full production during the winter of 1951-52. Located on a 45-acre deposit at Centerville, 22 miles south of downtown Oakland, the plant incorporates many ideas which reflect Mr. Gildersleeve's long operating experience. His chief objective, aside, of course, from flexibility and economy of operation, was to provide for any prospective additions or enlargements without alteration to the existing layout and equipment. Figured theoretically to produce about 150 t.p.h., the new plant has actually turned out 240 tons of washed and sized aggregates when the pit was

A general view of the new plant. At the right are truck-loading bins, with the rinsing screen overhead.

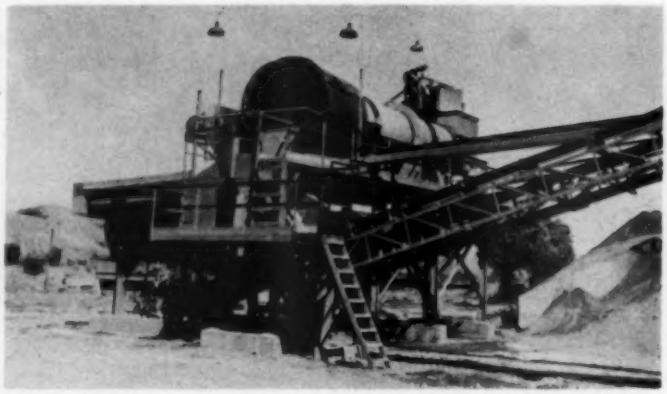
D. A. Gildersleeve, designer, builder, and manager of operations. In the background are stockpiles and stacker belts.

run in ideal proportions.

Thorough testing of the deposit to predetermine the feed to the new plant and to fit the chosen equipment to these raw material characteristics have had much to do with the smoothness of plant operations. Conveyor capacities are ample to handle any surges in the material flow; stocks of the three desired sizes of coarse gravel are maintained in balance through a flexible sizing and crushing arrangement; and the sand is kept within close limits of the desired fineness-modulus, with practically no loss of the wanted extreme fines which are known to be present in the necessary volume in the pit. Evidence of this was established along about June 1, 1952, when, after about 125,000 tons had been run through the plant, an analysis of settlings in the pond water showed only a neglible amount (2 percent) of solids.

The deposit is located at the extreme end of what is known in local geological circles as the "Niles Cone", an ancient wash from a ridge of hills through which flows Alameda Creek enroute to San Francisco Bay. The gravel and sand are inclined to lie in layers, the top 20 ft. running heavily to sand, with a 2- to 4-ft. thick stratum of clay separating the coarser gravel below. A working depth of 60 ft. is anticipated before too much water is encountered. The deposit was overlain by about 6 ft. of exceptionally rich loam which was stripped off earlier and sold for top soil.

Excavating is done by a Bucyrus-Erie 38B diesel dragline pulling a 1¾-cu. yd. bucket which loads a 20-ton capacity bottom-dump Euclid. This single haulage unit has proved ample so far with the short haul to the hopper. As the distance increases, however, it will be necessary to add a second carrier. A 7-in. grizzly spans the 25-ton receiving hopper, although a boulder large enough to be rejected is seldom encountered. A variable-speed belt-feeder lays a ribbonlike layer of material on the conveyor running up to the plant, a counter-weighted gate preceding the feeder to prevent binding by the larger pieces.



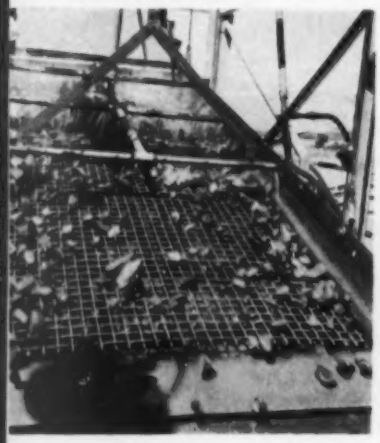
The 6- by 18-ft. scrubber, showing the trommel end and the sand jacket. Oversize feeds directly to the jaw crusher on the balcony platform. At the left is the overflow end of the sand classifier.

The 30-in. by 130-ft. plant conveyor inclines at a 14-deg. slope and runs at slow speed (280 f.p.m.) to obviate roll-back, and to permit a picker to remove any clay lumps handily. At the upper end of the belt the material discharges, via a rock box to relieve impact, into the 6- by 18-ft. scrubber. The scrubber has 2½-in. perforations at the discharge end, with a ¼-in. mesh sand jacket enveloping the punched-plate section. Plus 2½-in. rock goes to a Kue-Ken 10- by 24-in. jaw crusher, where it is reduced to minus 2-in. before joining the trommel throughs. The function of the Kue-Ken is primarily, of course, to reduce the oversize. However, because of the no-rubbing action of the jaw plates it also makes the reduction while generating an absolute minimum of undesired extreme fines.

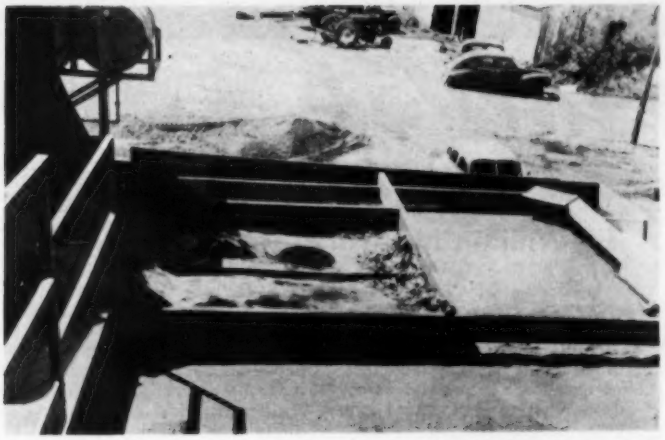
Water and sand passing the jacket on the trommel end of the scrubber enter the sand classifier immediately below and alongside. This classifier, designed by Mr. Gildersleeve, is fitted with four parallel screws, a baffle controlling initial turbulence as the sand and water pour in. The screws are 18 in. in diameter, 28 ft. long, and the double flights are pitched 6 in. and turn slowly (10 r.p.m.) to provide thorough dewatering at the discharge end. In an attempt to prevent bearing wear at the submerged lower shaft ends, which is so often a headache with this type of equipment, the chambers around the anti-friction bearings are tightly sealed and grease packed, and kept packed under pressure to prevent any sand from entering. Chain drives on the screws are designed to eliminate shaft thrust.

The wash box is 6½ ft. deep at the lower end to induce complete settling of all the sand over the screws; this, combined with low velocity and absence of turbulence, apparently accounts for the high recovery of fines which might otherwise be lost in the overflow of the

Left: The first of two gravel washing-and-sizing screens. Plus 1½-in. material here is being scalped off and diverted to the cone crusher in closed circuit.



Right: The upper end of the four-screw sand classifier. Note the dryness of the dewatered material.



Water and sand from the scrubber enter the lower end of the classifier, baffled to reduce turbulence to the minimum.

dirty water over the weir. The dewatered sand (only concrete sand is produced), which maintains an average fineness-modulus of about 2.90 with surprising regularity, is stored in a radial pile over the east end of the recovery tunnel. A typical sand analysis as provided by Mr. Gildersleeve follows:

Passing	No. 4	99	percent
"	No. 8	79	"
"	No. 16	62	"
"	No. 30	45	"
"	No. 50	19	"
"	No. 100	4	"
"	No. 200	1	"

Returning to the gravel flow from the scrubber and trommel, a 24-in. by 140-ft. belt conveyor carries the material to the screening tower where it passes a baffle box before hitting an Allis Chalmers Ripl-Flo 5- by 12-ft. double-deck screen. Plus 1½-in. is scalped off and sent to a Symons 3-ft. standard cone crusher in closed circuit with the supply conveyor. Lowerdeck rejects are finished gravel in the ¾- to 1½-in. range. Another Ripl-Flo 2-deck screen of the same size makes the other two finished gravel sizes, ½- to ¾-in., and 3/16 to ½-in. Minus 3/16-in. throughs are flumed back to the sand classifier for processing along with the natural sand. Both sizing screens are equipped with washing sprays, pipes perforated with two rows of drilled holes. A 300-ft. well supplies the wash-water requirements, a 100-hp. Byron-Jackson vertical deep-well pump yielding 1,100 g.p.m. at 70 lb. pressure at ground level.

Distribution to the scrubber and screens is by 4-in. piping. Three 18-in. wide stacker belts build up storage piles over the 185-ft. long reinforced-concrete tunnel. Quadrant gates, fitted with stop-flow boxes to prevent pile-up in case the conveyor halts, feed any of the gravels or the sand to the belt, or blend them as desired. At a transfer point just outside the tunnel, a 24-in. by 175-ft. inclined conveyor carries the aggregates up to a set of four 100-ton truck-loading bins. Two more bins are to be added shortly. A Bodinson 4- by 8-ft. rinsing screen can be used at the loading bins. Otherwise a spout which swings in a complete circle puts the material directly into the proper bins. About 75 percent of the output is used in the R. & J. batch plants, the company operating about 30 truck-mixers in addition to several Mixermobile units for mixing-hoisting-placing on the job. The truck-trailer delivery units carry 24 tons and can be loaded in a matter of 3 minutes. The surplus is sold commercially in the East Bay area. A 60-ft. Fairbanks truck scale weighs out the shipments.

The plant is of concrete and steel throughout, steel structures having been fabricated by the Bodinson Manufacturing Company of San Francisco and erected by company forces under Mr. Gildersleeve's direction.

As soon as the need arises, and this appears to be in the not-to-distant future, the company plans to erect still another batch plant on the Centerville property.

Kelley Island Lime & Transport To Have New $8,000,000 Plant

Officials of the Kelley Island Lime & Transport Company, Cleveland, Ohio, have announced the completion of negotiations with six steel companies for the construction of an $8,000,000 limestone plant at Rockport, Mich.

Bethlehem Steel, Youngstown Sheet & Tube, Republic Steel, Great Lakes Steel, Wheeling Steel, and Weirton will form a separate company to build the processing plant on Kelley's Rockport quarry properties. According to company spokesmen, the facilities will include a pier to accommodate lake limestone carriers.

It was indicated that Kelley will operate the new plant on a fee basis. The firm will also receive royalties for its high-grade metallurgical limestone quarried at the site. An annual production of 4,000,000 tons of limestone is anticipated, an amount sufficient for the needs of the steel concerns.

Michigan operations of Kelley Island Lime & Transport were discontinued in 1947, and the processing plant was dismantled in 1949.

New Crushed Stone Quarry Opened in Georgia

Columbus, Ga., is the site of a granite quarry opened in June by the Columbus Rock Company at the cost of between $400,000 and $500,000. Officers of the company are Charlie Frank Williams, president; W. P. Moss and C. Edwin Gates, vice-presidents; and Mike Bruni, secretary-treasurer.

Covering an area of 300 acres, this new operation produces 100 tons of crushed granite per hour, which is to be used for concrete aggregate in the Columbus locale. The plant facilities consist of an office building, dynamite magazine, detonator house, four-acre lake from which water is pumped for washing the crushed aggregate, and several small buildings.

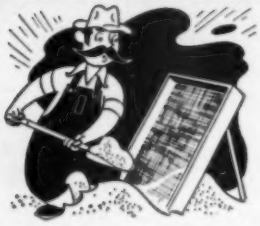
Washington News

(*From page* 72)

An additional explanation that is being offered is that 1950 was a very abnormal year. The beginning of the Korean war in the middle of the year set off a wild buying spree in both soft and hard goods, particularly major household appliances, automobiles and houses. Most of the families who rushed out to buy new refrigerators, television sets, washing machines, cars or houses, or some combination of these, spent far more than their incomes even if they only placed down payments on these items.

While reasonable explanations can be set forth to reconcile these differences, the fact that they exist indicates that caution must be exercised in the use of "official" statistics. For example, the high savings rate reported by the Commerce Department has frequently been pointed to as a sign that there is a large latent demand for goods provided the price is right. The Labor Department data raise a serious question as to whether the savings are held by the same people who would want the goods.

Screenings



by William M. Avery

WITH political candidates of both parties knocking themselves out just now in an effort to drown opposition in a sea of verbiage, it may be pertinent to note that most of the important pronouncements throughout history have been characterized by the now-almost-lost art of saying much in few words. Some conspicuous examples: the Lord's prayer, 66 words; the Ten Commandments, 197 words; and Lincoln's Gettysburg Address, 266 words.

Our own Declaration of Independence stated the complete case for man's freedom in just 1,348 words, and nobody seems to have been able to make any significant addition to the subject in the 177 years which have elapsed since it was written. It might be noted, by way of contrast, that a recent Office of Price Stabilization order reducing the price of cabbage ran on for 26,911 words. Most of the political speeches we've heard lately seem to have been written by the same lads who grind out OPS blurbs, and we think either of the candidates could deliver the cabbage opus some night over a national hookup without seriously affecting the general tone or the intellectual level of the campaign.

Yummy!

THE clay brick people are really going all out in their efforts to recapture some of the markets taken over by the concrete block industry.

One outfit, the Malvern Brick & Tile Co., of Malvern, Ark., is turning out its product in such beguiling colors as Valencia treebark, suntan, earth blend, and banana. We understand that for a nominal fee they will even split the last named item and sprinkle it with nuts.

By A Dam Site

ACCORDING to the Portland Cement Association's *Cement & Concrete Reference Book*, there is a sign on top of Shasta Dam which reads: "This is government property. Do not remove". The book

points out that the dam contains 6,541,000 cu. yd. of concrete with a weight of about 12,000,000 tons.

Well, we still think Uncle Sam is wise to keep an eye on his property. A 12,000,000-ton unguarded monolith would just present an interesting challenge to souvenir collectors of the present era.

What's In A Name?

THE New York Trap Rock Corporation is having quite a tussle with the town board of Clarkstown to establish the right to quarry some 40 acres of its own property located on the side of High Tor, a mountain peak made famous by Maxwell Anderson's prize-winning play which was named for it. In 1939, after the peak had become famous, a zoning law was passed prohibiting excavation, but the company claims it is not bound by this restriction because it acquired the property in 1929, when High Tor was just any old hill overlooking the Hudson River.

We're not familiar with the history of High Tor, but it's a fair bet that the present issue would never have come up if it had been christened with some reasonable name like Skunk Mountain or Schnorkleberger's Hill.

The company might keep this thought in mind next time it goes shopping for a mountain.

Temporary Structure

ITALIAN architects, according to a recent news item from Pisa, are a bit glum about the future of the famous Leaning Tower. Seems they're trying another injection of grout in an effort to check the rate of settlement, but they predict that the whole works will come crashing down in about 400 years. We hope that they have initiated steps to blacklist the firm of bunglers who built the original foundation back in the twelfth century.

Career

Fellow down in Miami claims he's doing a land office business turning out precast concrete tombstones for pets. Current production is at the rate of 60 units per day, and orders are coming in from humane societies and pet cemeteries all over the country. To date he has made grave markers for dogs, cats, parrots, monkeys, and even skunks, and one of his products marks the final resting place of the late Gargantua, well known circus gorilla.

We're currently engaged in trying to get a similar venture launched up at Bar Harbor, Maine. Soon as we succeed, we're going to form a National You-Name-It-We've-Got-It Concrete Tombstone Association and get ourself elected executive secretary. We'll hold two meetings a year; one at Miami, lasting from November through April, the other at Bar Harbor for the remainder of the year. Sounds like an exhausting schedule, but we've lived a comparatively clean life and should be able to stand the gaff for 30 or 40 years.

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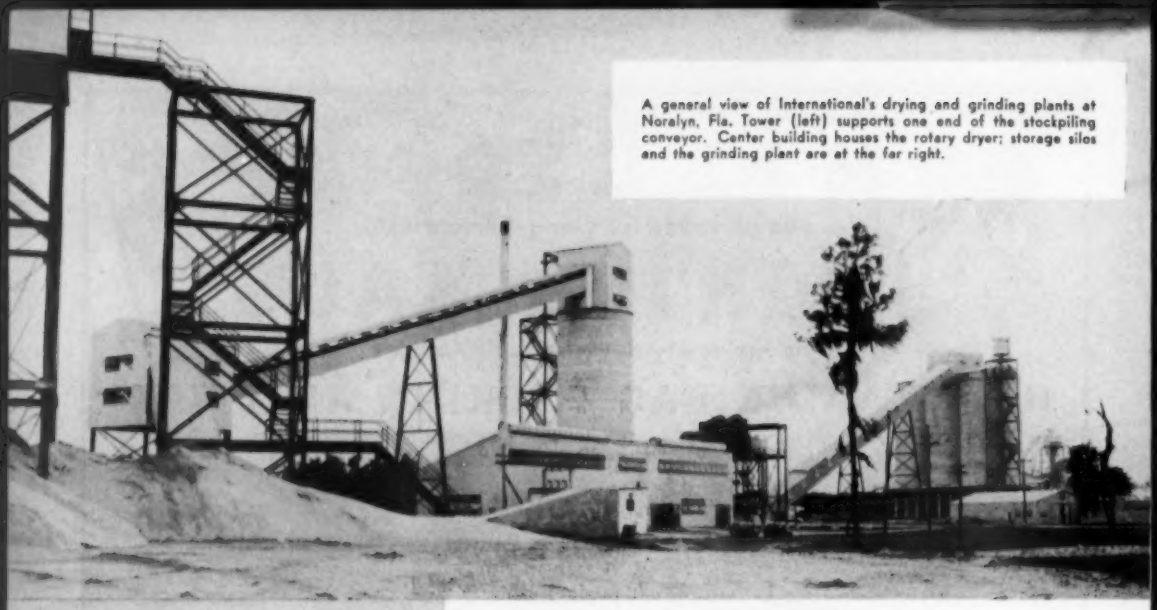
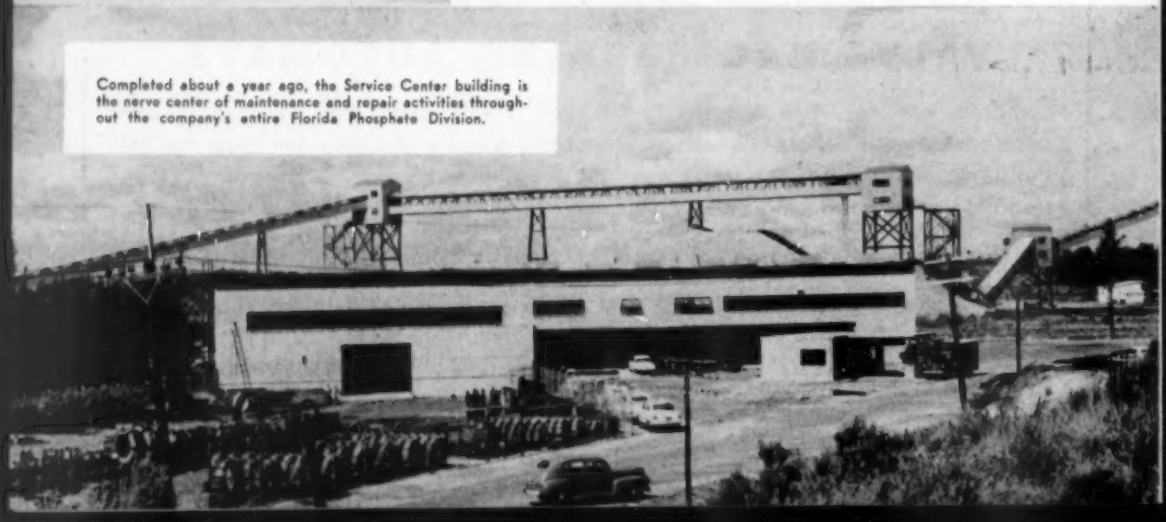


A general view of International's drying and grinding plants at Noralyn, Fla. Tower (left) supports one end of the stockpiling conveyor. Center building houses the rotary dryer; storage silos and the grinding plant are at the far right.

NORALYN *Revisited*

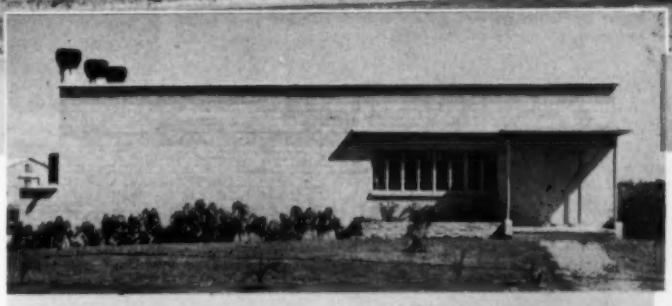
International now operating drying and grinding plants in conjunction with world's largest phosphate plant

By WILLIAM M. AVERY



Completed about a year ago, the Service Center building is the nerve center of maintenance and repair activities throughout the company's entire Florida Phosphate Division.

The new headquarters of the Florida Phosphate Division is a $350,000 air-conditioned structure located at the entrance to the Noralyn plant.



The most recent building addition at Noralyn is this air-conditioned assay laboratory completed several months ago.

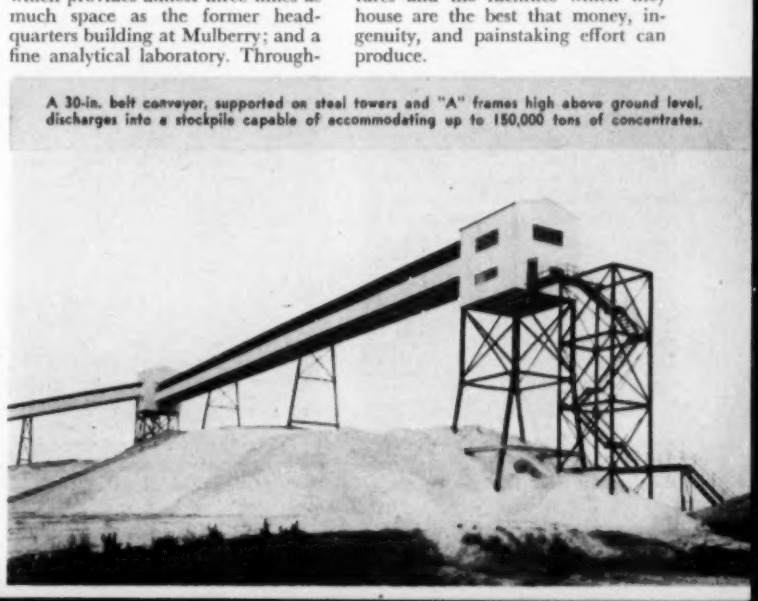
another ON THE SPOT report

THE world's largest and most modern phosphate plant, which PIT AND QUARRY described* in considerable detail at the time of its completion in 1948, has been the scene of almost continuous major construction activity since its formal opening on April 20 of that year. The plant we refer to is, of course, the Noralyn property of the International Minerals & Chemical Corporation, located near Bartow, Fla., which we hailed in our original article as marking a culmination of all the accumulated know-how and the vast technological progress in mineral recovery gained over the last half century.

The original work at Noralyn included the installation of facilities for mining, washing, and concentrating approximately 1,500,000 tons of high-grade pebble phosphate annually. After the basic plant was in full production, work was begun on the construction of the drying and grinding plant, which is the primary subject of this report. The dryer was completed early in 1949, and the first of the two huge grinding mills went into service in May, 1950, with the second unit following in 1951.

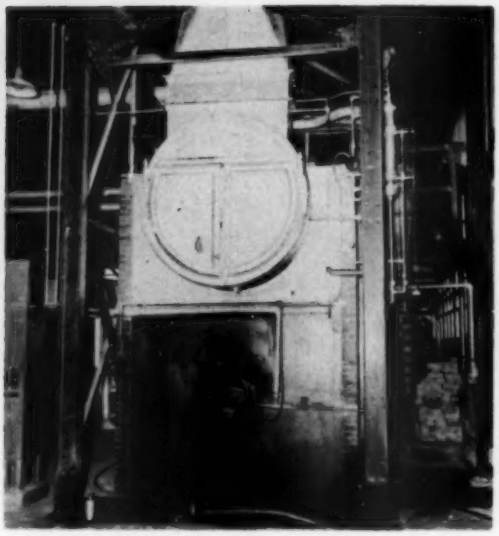
Among other major projects completed more recently at Noralyn are a $500,000 Service Center, which is the nerve center of maintenance and repair activities throughout International's entire Florida Phosphate Division; a $350,000 ultra-modern air-conditioned office building, which provides almost three times as much space as the former headquarters building at Mulberry; and a fine analytical laboratory. Throughout all of this construction activity the company's engineers have been mindful of Noralyn's unique position of leadership in the phosphate industry, and as a result the new structures and the facilities which they house are the best that money, ingenuity, and painstaking effort can produce.

A 30-in. belt conveyor, supported on steel towers and "A" frames high above ground level, discharges into a stockpile capable of accommodating up to 150,000 tons of concentrates.



*See Avery, William M.: *Noralyn Mine Opens New Era*, PIT AND QUARRY, June, 1948, page 66.

Above: One of the two 6-ft. diameter table feeders used to feed phosphate from a storage silo to the dryer.



Right: Steam for preheating the fuel oil is supplied by this horizontal return-tube boiler.

Wet Storage Only two grades of material (75 and 77 percent b.p.l.) are shipped in quantity from Noralyn, and these are the products which are fed to the drying and grinding circuits. The relatively small quantity of washer pebble produced, amounting to perhaps 500 tons per day, is sent to International's plant at Mulberry, from which all grades of phosphate are shipped.

The high-grade flotation and spiral concentrates move from the plant proper over a network of totally-enclosed Jeffrey belt conveyors which discharges into an open storage pile. The final 30-in. conveyor in this handling system is supported high above ground level on steel towers and "A" frames, and is equipped with a tripper which serves to distribute the material over the entire length of the storage area. Further distribution to either side of the conveyor is accomplished by bulldozing, so that at need up to 150,000 tons of concentrates can be kept in storage.

The storage system serves a two-fold purpose. It provides a necessary cushion between the spiral and flotation sections of the plant, which produce the same end product month after month, and the shipping and grinding department, which produces various grinds in accordance with customer demands. It also provides a means of removing some moisture from the concentrates by natural evaporation, thus reducing the load which the dryer must carry. For this reason it is the practice to avoid using current production as feed for the dryer by drawing most heavily on material that has been in storage for some time. Since the differences in the two grades of phosphate are somewhat apparent to the eye, there is little difficulty in keeping them separate, although occasionally some blending is done deliberately in order to obtain a greater range of end products.

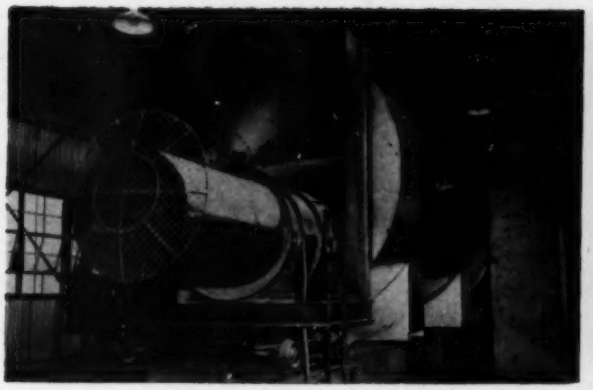
Since accurate running inventories are important in modern phosphate operations, two conveyors in the handling system, one ahead of wet storage and the other located beyond the dryer, are equipped with Merrick Weightometers. Samples are also taken at both locations with automatic samplers in order that moisture may be determined and the running inventory maintained on a dry basis. Chain tests are run on the Weightometers once a week as a check on accuracy, and plant engineers make a physical survey of the storage pile every three months in order to adjust inventory.

Three 36-in. wide Jeffrey belt conveyors, one of which is located in a reclaiming tunnel beneath the stockpile, are the means of feeding phosphate out of storage into the drying circuit. The material is drawn through wicker gates in the roof of the tunnel into traveling hoppers which straddle the reclaiming conveyor. The third conveyor in this series discharges into a 1,000-ton flat-bottom concrete silo which serves primarily to provide surge capacity for the dryer. Although the company has no immediate plans for the installation of a second dryer, the conveyor system has sufficient capacity to feed an additional unit if it should be required at some time in the future.

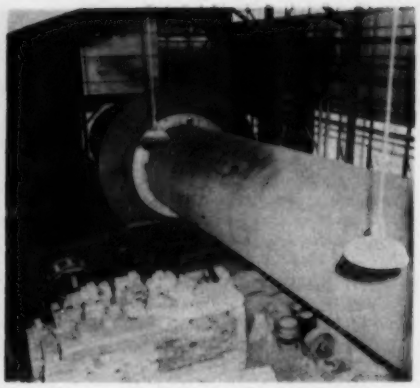
Drying Plant Two 6-ft. diameter Allis-Chalmers table feeders are used for feeding phosphate from the storage silo to the dryer. The rotary dryer itself, which was also furnished by Allis-Chalmers, is 8 ft. in diameter by 80 ft. in length and is fired with Bunker C fuel oil by means of a B&W mechanical burner. Steam for heating the fuel oil is supplied by a 150-hp. Combustion Engineering horizontal return-tube boiler. The dryer is supported on two piers and has a pitch of ½ in. per ft.

Except for a distance of about 5 ft. at the discharge end, the entire length of the dryer is equipped with flights which produce a cascading action as the unit rotates. The combustion of fuel takes place in a drum-type furnace at the feed end of the dryer, and the hot air is drawn through the unit by means of a Robertson double-blade fan. Gas temperatures range from 1,500 to 1,700 deg. F. at the entrance end, and from 170 to 200 deg. at the exit end.

Since synchronous (constant speed) motors are used to drive both the dryer and the fan, the entire drying operation is controlled primarily by regulating the table feeders and by adjusting the fuel oil feed rate. The drying rate varies from 150 to a little over 200 t.p.h., depending upon the amount of moisture contained in the feed, which in turn varies with weather conditions and the length of time the material has been held in storage.

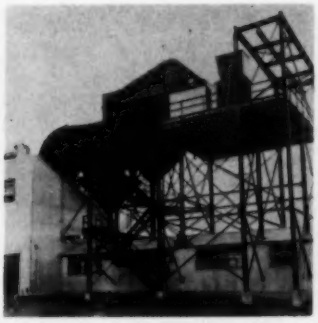


Combustion of the fuel takes place in this drum-type furnace ahead of the dryer. Gas temperatures range from 1,500 to 1,700 deg. F.

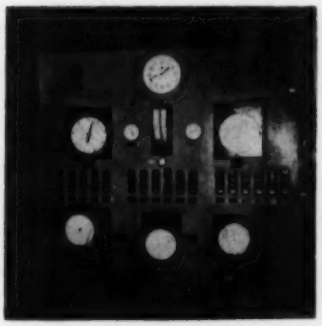


The rotary dryer is 8 ft. in diameter by 80 ft. in length. It is supported on two piers and is driven by a constant-speed motor.

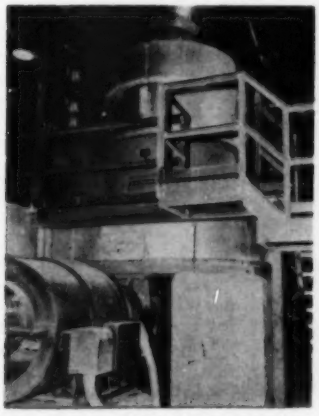
Dried phosphate discharges from the dryer onto this 36-in. hot-material belt. The pipe in the foreground blends recovered dust with the primary product of the dryer.



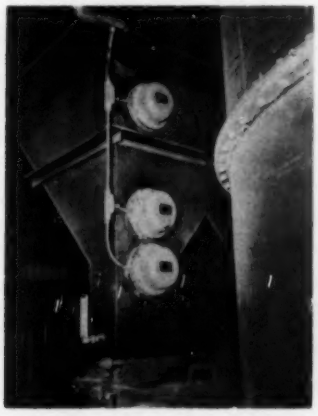
Gases from the dryer are exhausted through a 12-cone cyclone recovery system. Recovery amounts to between 400 and 500 tons every 24 hours.



The main control panel in the drying plant. The device at the lower left records the weight of dried phosphate passing over the belt conveyor to the storage silos.



One of the two 73-in. roller mills used for grinding. The material is classified to the desired fineness by the separator above.



Feed hoppers ahead of the mills are equipped with diaphragm devices which start and stop the belt conveyors (under the dry bins).

Each mill operates in circuit with a 14-ft. diameter cyclone separator located outside the building. All ground material is loaded directly into cars.

Crude moisture normally ranges between 10 and 16 percent, as compared with only one or two percent for the dried material.

Gases from the dryer are exhausted through a 12-cone Buell cyclone recovery system, which is in turn exhausted to atmosphere. The product recovered is not a dust in the strict sense, since it contains a fairly large amount of coarse, granular material. Recovery, amounting to between 400 and 500 tons every 24 hours, is virtually 100 percent, and the material is continuously blended with the primary product of the dryer as it is conveyed to the storage bins.

Both the dryer and the cyclone collectors discharge onto a 36-in. hot-material belt equipped with a Dings magnetic head pulley to remove tramp iron. This conveyor delivers the entire flow to a point above the three 40-ft. diameter by 73-ft. high concrete silos, each of which has an available storage capacity of about 3,000 tons. The center silo is filled directly from the long inclined belt, while the end units are reached by means of a reversible shuttle conveyor. The silos, or dry bins as they are referred to by plant personnel, serve mainly as a means of storing dried phosphate which is to be fed to the grinding materials, but the greater portion of the material (about 75 percent) is loaded directly into cars for shipment in the granular form. There are three tracks beneath the bins for loading cars. Thus it is possible to load on one track while loaded cars are being replaced by empties on another track.

About 75 percent of the material is loaded for shipment in the granular form, cars being loaded by gravity from the dry bins located directly above one of the three tracks.

Grinding Plant Primary equipment in the drying plant consists of two Raymond No. 73612 Super Roller Mills equipped with Whizzer separators for classifying to desired fineness. Each mill operates in conjunction with a 200-hp. circulating fan which sweeps fine and medium fine material from the grinding zone upward into a separating chamber. There the action of rotating radial blades carries material of the desired fineness away from the mill, while coarse particles collect against the sides of the separator chamber and then drop by gravity back into the grinding zone. By varying the speed of the Whizzer blades, the fineness of the end product can be controlled within very narrow limits.

Feed hoppers ahead of the mills are equipped with low- and high-level Bin Dicators which automatically start and stop the 24-in. Link-Belt belt conveyors located under the dry bins. Automatic controls provide for feeding either mill or both from any one of the three dry bins, actuating gates and conveyor drive motors on a start-and-stop basis in accordance with the rise and fall of material in the mill feed hoppers. The control panel provides for eight different combinations of feeding, depending on what material is to be ground (*i.e.* 75 or 77 percent b.p.l.), whether one or two mills are to be operated, and which of the three bins is to be used as the source of feed.

Each mill operates in circuit with a 14-ft. diameter Raymond cyclone collector, these units being supported on steel towers located between the two tracks which serve primarily for shipping ground phosphate. Material of the desired fineness is airborne from the mills through outlet pipes which terminate at the collectors. There the ground phosphate settles and is discharged by gravity through double-flap valves to railroad cars. Air from the collectors is recirculated through the mills, with the result that losses of ground material are quite inconsequential.

Four grinds are produced: 50 percent passing 200-mesh, 60 percent passing 200-mesh, 90 percent passing 100-mesh (or roughly 72 percent passing 200), and 85 percent passing 200-mesh. Ordinarily the coarse grinds are used by customers who are equipped with batch bins. The finer grinds are preferred where continuous bins are to be used, and for direct application to the soil.

No ground material is ever stored, and there are no facilities for this purpose. Thus the grinding plant is operated entirely on a backlog of specific purchase orders, which is one of the primary reasons for the considerable trouble the company goes in to order to maintain an accurate running inventory.

Discharge from the cyclone collectors is loaded continuously into box cars on either of the two railroads sidings used for this purpose. Rubber chutes or Stephens-Adamson swivel loaders are used for distributing the material in the cars. Fuller-Huron Airslides have also been provided for transferring ground phosphate from either collector tower to the other as a means of expediting the loading operations. Two Whitcomb diesel-electric locomotives, one 65 and the other 35 tons, handle cars on the sidings, and there is a Link-Belt motorized car puller for spotting them at the various loading points. There is also an installation of Howe track scales for weighing all outbound rock.

International maintains close grade control of all material shipped from Noralyn by taking frequent samples for chemical analysis. A Geary Jennings automatic sampler is used for this purpose in order to eliminate the human factor. Samples are taken at 10-minute intervals from the inclined conveyor which elevates dried phosphate to the storage silos, and these are analyzed to determine b.p.l. and moisture content. The same type of sampler is used ahead of the dryer to determine crude moisture alone for the purpose of inventory adjustment.

The drying and grinding plants operate on a three-shift basis four to seven days per week, depending on the volume of orders. About 20 men are employed per shift. J. L. Frye is preparation superintendent for International's entire Florida Phosphate Division, and W. T. Sprott is superintendent of the drying and grinding sections at Noralyn. Except for the grinding plant, all the construction work here described was done by the Rust Engineering Company.

Noralyn mine is located in the approximate center of a 3,000-acre tract which is believed to contain the highest grade of pebble phosphate known in this section of Florida. About 12 acres of the property are mined out each month to keep the huge plant in full production. About 10,000,000 cu. yd. of overburden and matrix are mined each year. The company's initial investment of approximately $10,000,000 in land, equipment, and buildings was based upon proven mineral reserves suf-

(*Continued on page* 95)

Factors In Heating a Screen

By J. E. DUNN
Allis-Chalmers Mfg. Co.

When electric power of proper voltage and current characteristics is applied to opposite sides of a screen, it becomes a resistance heating element. Your toaster at home works on the same principle.

When passing moist coal over and through unheated screen cloth, fine particles adhere to the wires due to the surface tension of the moisture. This condition is called "blinding" and the object of heating the screen is to eliminate, as much as possible, any blinding that occurs.

When water is heated, its vapor pressure, rate of evaporation and surface tension undergo significant changes. Figure 1 shows this effect in terms of percentage variation at constant atmospheric temperature and humidity. Heating the wires evaporates the moisture in contact with them and the attachment between the particles and the screen is quickly broken by the screen vibration.

A natural question at this time is: "How much heat is necessary to accomplish the desired evaporation rate?" To better answer this question, several factors must be considered. Primary voltage is generally 220 or 440 volts. This is cut down to 2 to 10 volts by means of a transformer before reaching the screen. Too much heat in the screen will be wasteful and might cause baking of the particles on the screen. Not enough heat will cause blinding to occur. The correct amount of current in amperes to accomplish the desired results is determined only after consideration of the following factors.

1) Tons per hour of feed.
2) Screen analysis of the feed, or amount over the screen and amount through the screen.
3) Surface moisture of the feed.
4) Temperature of the feed.
5) Rate of travel of the feed over the screen.
6) Humidity of the atmosphere.

After due consideration of each of these points, the correct amount of secondary voltage (or amperes transmitted to the screen cloth) can be determined to achieve the objective of a screen cloth temperature of 160 to 180 degrees F. without feed. With feed the screen temperature should be maintained in the neighborhood of 100 degrees F. Let us briefly consider the effect of each of the above factors on screen temperature.

1) *Tons per hour of feed.* The greater the rate of feed, the higher the temperature will have to be because the same results must be obtained in the shorter interval of time in which any portion of the feed will be in contact with the screen and because of the increased cooling effect of the material pass-

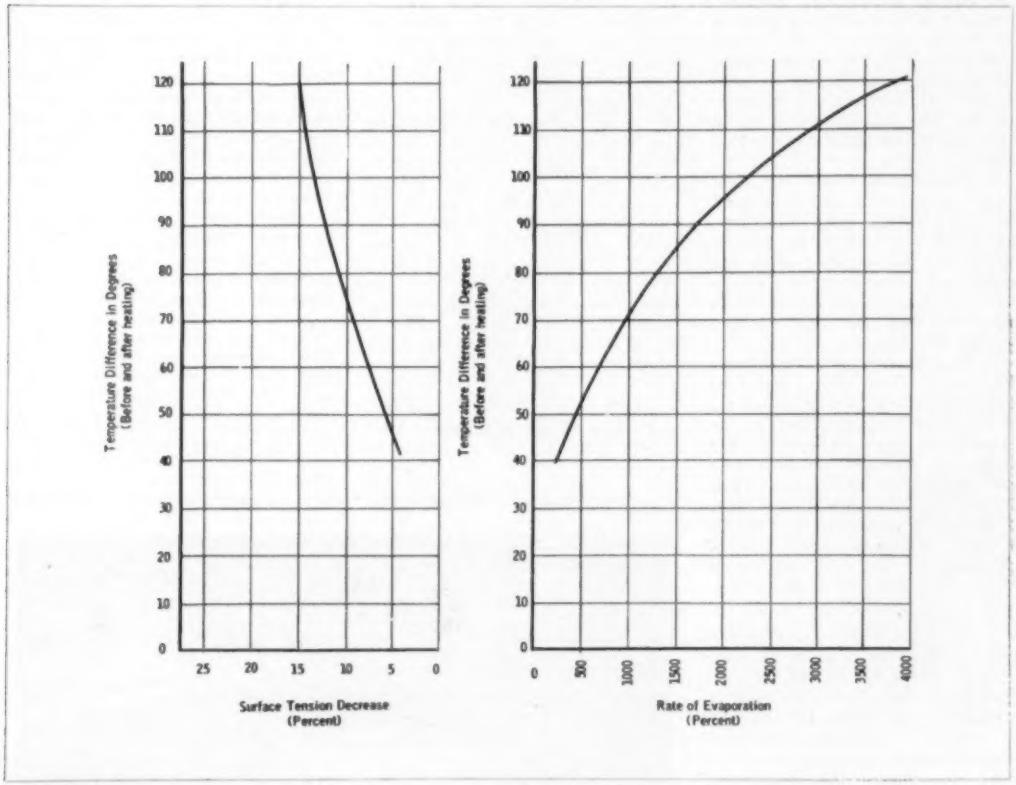


Fig. 1—Effect of resistance heating on surface tension and rate of evaporation.

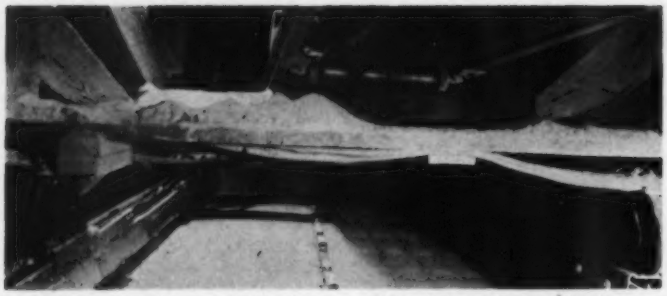


Fig. 2—Screening with a properly heated screen tends to eliminate blinding. This photo was taken a few minutes before Fig. 3.

ing over the screen.

2) *Screen analysis of the feed.* The greater the amount passing over the screen as compared to the amount passing through the screen, the lower is the temperature required. Another way of saying it is, the greater the amount that must pass through the screen, the greater will be the number of particles that will normally adhere to the screen, and therefore the temperature must be higher to effect a faster rate of evaporation of the moisture.

3) *Surface moisture of the feed.* Because it is the surfaces of the feed that contact the screen, the amount of moisture collecting on the screen will increase as the surface moisture of the feed increases. To counteract this, the temperature must be higher to effect a faster rate of evaporation.

4) *Temperature of the feed.* Heat always moves in a direction from the warm to the cold. Therefore, the colder the feed is the greater will be the flow of heat from the screen and consequently the higher the screen temperature must be in order to maintain the specified average temperature.

5) *Rate of travel of the feed over the screen.* The faster the feed moves over the screen the faster the moisture will collect. Therefore, the temperature must be higher in order to effect a rate of evaporation that will compensate for the faster rate of moisture collection. At this point it should be emphasized that for a given amplitude and cycle of vibration, a wet feed will move across the screen at a slower rate than a dry feed. Therefore, to obtain efficient screening, the feed rate of wet material must be such that the depth of the bed will not be greater than maximum particle size. With dry feed, the bed can be from 2 to 2½ times maximum particle size in thickness.

6) *Humidity of the atmosphere.* As the percent humidity of the atmosphere decreases, the evaporation rate at any given temperature increases. In order to maintain a satisfactory evaporation rate, the temperature difference between the screen and that of the feed and atmosphere should be increased for high atmospheric humidity and may be decreased in dry climates and seasons of low humidity.

The above conditions are applicable to all heated vibrating screens. Some additional conditions are peculiar to individual installations and when present must also be considered. One of these conditions is the intermittent screening of moist material with dry material. In general, the transformer rating should be stepped up and the rate of feed decreased during the interval that the wet material is being screened. One plant reports that when handling 1½" x 0 wet coal carrying 7 to 8 percent surface moisture for time intervals of approximately 20 minutes and then dry coal in between, blinding does not occur if no change is made in either the feed rate or the transformer setting. When the wet screening period is an extended one, the screen tends to cool off and blinding may occur.

Another factor that must be considered on an individual screen basis is the material used to make the screen. A stainless steel screen requires about one-half as much current as a carbon steel screen due to the higher resistance of the stainless steel to current flow. Because of this a smaller transformer can be used. Stainless steel will outlast carbon steel in an unheated screen about three to one and in a heated screen about six to one when handling wet material under average conditions. Stainless steel is always preferable for screening wet materials.

Production increases with use of a heated screen. Screening of moist material on the finer openings is made possible. Dust is kept down to a minimum automatically. Numerous shutdowns during the day for purposes of cleaning the screen are eliminated in almost all cases.

Another question which may be in the minds of the readers is: "Does the heat given off by the screen affect the moisture content of the material?" The answer to this is no. The time that the material is in contact with the screen is less than a minute and the temperature of the screen is only enough to evaporate the moisture that tends to blind the screen openings.

Figures 2 and 3 show clearly the difference between screening with a heated screen and an unheated screen. These two pictures were taken on the same screen within a few minutes of each other. Figure 3 illustrates the blinding that occurred when the low voltage current to the screen was turned off.

Where screen openings are one-half inch or smaller, resistance heating of the screen is almost a must in order to eliminate blinding with most wet materials.

The Kaiser Gypsum Company, a California corporation with $100,000 capital stock, recently filed articles in the Oregon state corporation department at Salem. The purpose of the company is to manufacture, distribute, and sell building materials and allied products.

Fig. 3—Blinding that occurred shortly after a low voltage current to the heating screen was turned off.

A general view of the new 100-ton pilot flotation mill of the Wyoming-Gulf Sulphur Corporation near Cody, Wyo.

Wyoming-Gulf Sulphur Corporation

by

James E. Quinn, M. E. and G. C. Frye, Editor, Deco Trefoil

Until recently sulphur has had the dubious distinction of being one of the most widely used, yet least known non-metallic elements. Few people realized the extent of its use in the manufacture of hundreds of familiar items. Today, however, due to an impending shortage of the yellow material, the world is beginning to take notice of its true significance. Discoveries of new uses and the mounting demand of manufacturers have placed increased emphasis on the search for new deposits to relieve pressure on Gulf Coast producers.

One of the most recent developments of low grade 25% sulphur deposits is that near Cody, Wyoming, in the Cedar Mountain Area. Here, within one year's time, the newly organized Wyoming-Gulf Sulphur Corporation developed ore reserves, designed and constructed a 100-ton pilot mill, and produced enough 85% grade concentrate to establish the economy of treating low-grade deposits by flotation.

Outcroppings on this site had been worked before by individuals using steam recovery methods. But this rarely produced more than a few hundred pounds per day. Preliminary testing by W. H. Marquette, who had had some 25 years of experience in flotation and sulphur recovery, indicated the feasibility of further developing these deposits.

This resulted, in December, 1950, in the organization of the Wyoming-Gulf Sulphur Corporation, with Mr. Marquette as the president and general manager. Diamond core drillings substantiated the original findings, and after three months sufficient commercial ore was developed to warrant construction of a 100-ton pilot flotation mill for recovering the sulphur.

During this preliminary drilling, pilot plant tests were conducted by the Denver Equipment Test Laboratory on a truck load of average ore, running approximately 25% sulphur. The results of these tests further encouraged the recovery of the sulphur in a high grade concentrate by means of flotation.

Geology and Mining

Due to the nature of the deposits in the Cedar Mountain Area there was, at first, some difficulty in tracing formations. All deposits are covered with over-burden or have a capping of travertine; some are found in the form of geyser cones capped with geyserite. By analyzing cores and cuttings from known deposits exposed by erosion, a fairly accurate picture was obtained which formed the basis for future development.

W. H. Marquette, president and general manager, and John Mollett, mill superintendent.

Mineralization

Mineralization and the formation of these deposits can only be theorized. One thought is that hydrogen sulphide comes from below in super saturated solution in hot water. As the hot solutions reach the surface and pressure and temperatures are lowered, oxidation from the cold air deposited crystalline sulphur around silicious gangue causing the deposit to build up to a thickness as great as 130 feet. This theory has been given further credence by a similar deposition in the lower walls and bottom of Shoshone Canyon, adjacent to the property, along the river. With a temperature of zero or below, sulphur is deposited around the throat of some of the hot water springs.

Another theory, suggested by observations of formations in Yellowstone Park near Old Faithful Geyser, points to the possibility that hot water algae acts to break down gypsum, forming free sulphur and calcium carbonate.

Overburden, varying from one to fourteen feet, covers the deposits. The sulphur domes generally occur

in series, overlapping each other, although there are several individual cones. It is thought that these may be vents created by the release of extreme pressure within Cedar Mountain. Further, evidence of some six glacial flows have been located, which may have played an important part in the deposition of sulphur.

Early Mining

Recovery of sulphur is not new to the Cedar Mountain Area. For quite a number of years steam methods were used in recovering liquid sulphur. For the most part these operations were limited to high ground where deposits were more likely to be exposed or within a few inches of the surface. At best, these methods produced little more than a few hundred pounds of sulphur per day, and were eventually abandoned.

Present Mining

The first mining operations by the Wyoming-Gulf Sulphur Corporation were centered around the deposits formerly worked by steam methods. As operations progressed, however, it was found that the richer deposits were located on lower ground, in depressions, contrary to early indications. Most of the ore is now taken from these areas.

Overburden is stripped from the deposits on the day shift by means of a bulldozer. The ore is drilled using 4′ holes on 4′ centers and broken up with seven sticks of 35% powder to the hole. The same man operates the bulldozer, drills the holes and sets off the charge with delayed primer and electric detonator. The cost for stripping the overburden and blasting is approximately $.25 per ton of ore.

The broken ore is then loaded by a 1½-ton End Loader into two 8-ton capacity trucks which haul the ore to the mill at the rate of 120 tons per day. The loading and haulage is contracted to a local firm at approximately $1.25 per ton.

Mill Construction

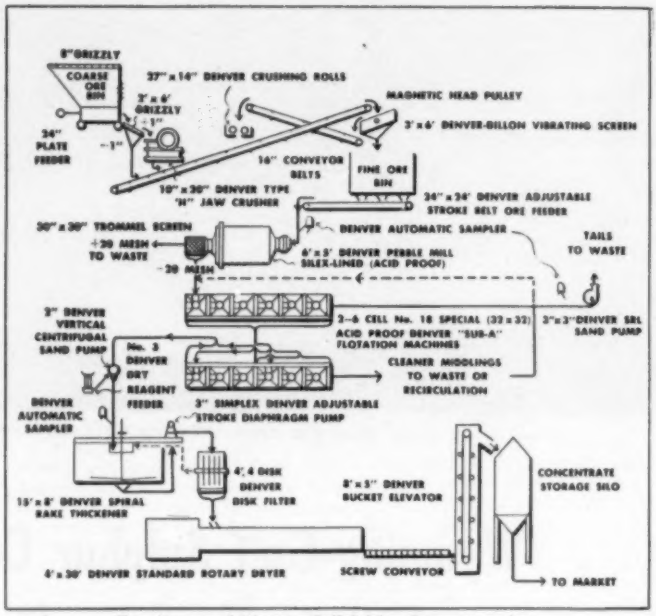
Ground breaking ceremonies were held on April 8, 1951 after further laboratory pilot plant testwork had been completed. Since many problems still remained to be solved, this installation was to be initially operated as a 100-ton pilot plant in order to completely prove the process and establish the type of equipment best suited for full-scale operating conditions.

Six months later, design and construction of the 100-ton pilot flotation plant were completed by the O. W. Wolvoord Company of Denver, Colorado, and operation commenced on November 7.

In view of the available supply of lumber on the property the mill is of all wood construction. There are no windows, and up-to-date fluorescent lighting equipment is used throughout the plant. Master control switches, designed to shut off all equipment in case of an emergency, are installed in crushing section, ball mill section and melting section.

Three men can efficiently operate the entire plant: one handling the crushing section, another the pebble mill-flotation section and the third, the thickening-filtering-melting section. Since crushing is normally done during the day shift, an extra man is available on the other two shifts for general mill work.

Results of initial operations were more than satisfactory, and it was then decided to convert the pilot plant to commercial production. These necessitated several adjustments, particularly in view of the high corrosive action of sulphuric and sulphurous acid for a continual, large-scale operation. Most of these changes were made without difficulty, and the company is now making plans to double the capacity of the installation in order to meet current market demands.


8"GRIZZLY
COARSE ORE BIN
37" x 14" DENVER CRUSHING ROLLS
MAGNETIC HEAD PULLEY
3' x 6' GRIZZLY
3' x 6' DENVER-GILLON VIBRATING SCREEN
24" PLATE FEEDER
16" CONVEYOR BELTS
FINE ORE BIN
10" x 20" DENVER TYPE "W" JAW CRUSHER
24" x 24' DENVER ADJUSTABLE STROKE BELT ORE FEEDER
30" x 30" TROMMEL SCREEN
DENVER AUTOMATIC SAMPLER
TAILS TO WASTE
+20 MESH TO WASTE
6' x 5' DENVER PEBBLE MILL SILEX-LINED (ACID PROOF)
-20 MESH
3" DENVER VERTICAL CENTRIFUGAL SAND PUMP
2-6 CELL No. 18 SPECIAL (32 x 32) ACID PROOF DENVER "SUB-A" FLOTATION MACHINES
3"x3" DENVER SRL SAND PUMP
No. 3 DENVER DRY REAGENT FEEDER
CLEANER MIDDLINGS TO WASTE OR RECIRCULATION
DENVER AUTOMATIC SAMPLER
3" SIMPLEX DENVER ADJUSTABLE STROKE DIAPHRAGM PUMP
4', 4 DISK DENVER DISK FILTER
8' x 3" DENVER BUCKET ELEVATOR
CONCENTRATE STORAGE SILO
18' x 8' DENVER SPIRAL RAKE THICKENER
4' x 30' DENVER STANDARD ROTARY DRYER
SCREW CONVEYOR
TO MARKET

Flow diagram of Wyoming-Gulf Sulphur Corporation plant.

Closed-Circuit Crushing, Screening

The crushing plant is designed so that one man can easily operate the entire section. One of three separate points, where the push of a button will stop all machinery in case of emergency, is located here.

At present all crushing is done in 7 hours. Approximately 125 tons of feed are reduced to—⅜″ size during this period. At a later date, when the capacity of the mill is increased, the crushing section will be operated on a 2-shift basis. This will provide adequate capacity without requiring additional equipment and installation expense.

Trucks from the mine drop the ore onto a 6″ grizzly located on top of the 150-ton capacity coarse ore bin. Oversize is broken through the grizzly by means of a double-jack. The coarse ore bin was built on the job with heavy timbers and has a sloping bottom for maximum live load capacity.

An inexpensive 24″ reciprocating plate feeder is used to deliver an even, positive rate of feed to a cast steel frame 10″ x 20″ Denver Jaw Crusher. This type of feeder is particularly well adapted because of the high moisture content of the ore.

The plate feeder discharges into a set of grizzly bars with 1″ spacing for removal of fines before the feed reaches the jaw crushers, thus re-

A set of 1 in. grizzly bars is used to remove fines before feed reaches the 10 by 20 in. jaw crusher, thus reducing wear on crusher plates and increasing capacity of the crushing system.

ducing wear on crusher plates and increasing the capacity of the crushing system.

A strong cast-steel frame jaw crusher is required to handle hard quartzite rocks present in the ore, which would damage an ordinary cast iron frame crusher.

The jaw crusher is set with 1" discharge. Undersize, together with the fines from the grizzly, is carried on a 16" x 70' conveyor travelling at 200' per minute on an 18° incline to a 3' x 6' Denver-Dillon Vibrating Screen. The +⅜" oversize from the screen returns on a similar 60' long No. 2 conveyor belt to a 27" x 14" set of Denver Crushing Rolls in closed circuit with the screen. This provides positive control over the size of material going to the fine ore bin.

Due to the moisture content of the ore the roll shells are equipped with a 3/16" hard alloy steel strip welded on the surface which forces the material into the rolls, thus preventing blinding. A magnetic head pulley located on the No. 1 conveyor feeding the Denver-Dillon Screen protects the crushing rolls from tramp iron.

Minus ⅜" undersize from the screen drops on a 16" x 35' No. 3 conveyor to a 20' x 15' x 3" stave Douglas Fir wood fine ore bin having 125-ton live load storage capacity. Ore from the bin is accurately metered to a 64½" pebble mill by a Denver Adjustable Stroke Belt Ore Feeder. Due to the tendency of the material to bridge over in the fine ore bin the ore feeder is provided with three feed hoppers. These enable feed to be drawn from any one of three points in the ore bin when bridging occurs.

Grinding

Since the particles of sulphur tend to adhere to the gangue and are not finely associated with the gangue, grinding, as we normally think of it, is not required. An attrition or scrubbing action is sufficient to free the values. Heavy density procelain balls are used as the grinding media in place of conventional steel balls, due to the acid conditions.

Flotation is accomplished most readily when the pulp has been heated. The dilution feed water to the mill, therefore, is introduced at 180° F. A 60% solids density in the pebble mill is carried to provide maximum polishing action.

The pebble mill is operated in open circuit and subsequent classification takes place on the mill discharge trommel screen. This screen consists of a coarse ¼" inner cloth, 10 mesh center cloth and a 20 mesh outer cloth, all stainless steel. The coarser cloths provide maximum wearing life for the 20 mesh cloth by removing the larger pieces of oversize.

Approximately 5% of the feed is discharged as oversize from the 20 mesh screen. Since the oversize material analyzes only 7% sulphur it is carried to waste in two small mine cars mounted on rails in front of the pebble mill.

Spray water at a temperature of 160° F. is used to keep the trommel screen clean and dilute the pulp to approximately 22% solids for subsequent treatment by Denver "Sub-A" Flotation.

This classification method has proved very effective, since most of the classification takes place in the first six inches of the trommel screen. Experiments are now being conducted to determine the alloy which will provide maximum life of screen cloths from the standpoint of both corrosion and abrasion.

Flotation

The diluted pulp flows by gravity to an 8-cell No. 18 Special (32 x 32) Denver "Sub-A" Flotation Machine. The cells of this machine are of acid-proof construction with wood tanks, rubber-covered shafts and molded rubber wearing parts to resist corrosion. Due to the coarse nature of the flotation, conical disk impellers are used in place of the receded type.

Rougher concentration, followed by cleaning and recleaning, is required to produce the desired 85% grade concentrate. The rougher cells produce a grade of 65%. Cleaning at 18% solids improves the grade to 75% and recleaning at 18% solids produces the final concentrate, assaying 85%. Overall recovery averages 90%.

Average flotation concentrates have the following screen analysis and assay:

SCREEN ANALYSIS, FLOTATION CONCENTRATES

Mesh, Tyler Standard	Percent Weight
+35	Nil
+ 48	3.20
+ 65	5.10
+ 80	2.95
+100	5.05
+150	8.50
+200	11.90
—200	63.30
TOTAL	100.00

ASSAY, FLOTATION CONCENTRATES

Elemental Sulphur	87.65 %
Silica and Silicates	10.15
Mixed Oxides (Fe, Al)	0.41
Calcium Sulphate	0.17
CaO	0.39
Arsenic	0.001
Selenium	0.001
Tellurium	0.001

Flotation Reagents

The sulphur in the ore is considered a "natural floater," and therefore the addition of only small quantities of reagents is required. The reagent cost per ton of ore treated is less than $.10.

Recent experimentation using the new Dow Frother No. 250 has shown improvements in both grade and recovery. Testwork along this line, however, has not been carried far enough to make any definite conclusions.

The cleaned concentrates are frothy in nature. Water sprays are introduced into the concentrate launder carrying the froth to a 2" Denver Vertical Centrifugal Sand Pump which breaks down the froth and pumps the concentrates to subsequent dewatering operations.

The flotation concentrates are on the acid side, having a pH of approximately 5.5. In order to avoid

Material passing from adjustable stroke belt feeder to 64½ in. pebble mill. Heavy-density porcelain balls are used in the pebble mill due to acid conditions.

Diluted pulp from the pebble mill, approximately 22 percent solids, flows by gravity to this 8-cell special flotation machine. Cells are of acid-proof construction, with wood tanks, rubber-covered shafts, and molded rubber wearing parts. Conical disk impellers are used in place of the recaded type.

the unnecessary expense of installing acid-proof dewatering equipment, 4 to 5 pounds of lime are added per ton of concentrates to neutralize the concentrates to a pH of about 7.

Lime is added to the concentrates at the Denver Vertical Sand Pump by means of a No. 3, 18″ Denver (Cone-type) Dry Reagent Feeder in order to provide thorough mixing action and thereby effect complete neutralization.

Thickening

Flotation concentrates, approximately 30% solids, are introduced into the feedwell of a 25′ x 10′ Denver Spiral Rake Thickener. Underflow from the thickener is metered out at 60% solids by means of a 3″ Simplex Denver Adjustable Stroke Diaphragm Pump. Clear water overflows the thickener and goes to waste.

Filtration

The thickened discharge from the diaphragm pump flows by gravity to a 6′, 2-disk filter. The elevation of the filter is such that any overflow from its tank returns by gravity to the thickener feedwell, thus eliminating the necessity of a pump or sump to handle the overflow.

In order to discharge a cake with the minimum moisture content required for subsequent melting operations, a thin ¼″ cake is pulled on the disk. The resulting cake contains only 12% moisture, extremely low for non-metallic flotation concentrates of this nature.

Melting

The filtered concentrates are conveyed to the melting section at the rate of approximately 25 tons per day. Here they are fed to one of two 6′ x 6′ Denver Heavy Duty Melting Agitators fitted with steam coils on the inside of the tanks. These melting agitators are operated on a batch basis. A temperature of 270° F. is necessary to thoroughly liquify the sulphur which melts at 235° F. The molten sulphur flows by gravity to a larger 8′ x 8′ agitator which acts as a collecting tank. Here, the sulphur is tested to be certain that all lumps have been dissolved.

After a certain retention time the concentrates flow by gravity through insulated pipes to two 25′ x 25′ x 8′ collecting bins for cooling and solidification. The sides of the bins are then removed and a charge of

Reagent	Function	Quantity	Strength	Points of Addition
Methyl Isol Butyl Carbinoil	Frother	.02 lbs./ton	Undiluted	#3 Rougher Cell
Kerosene	Collector	.03 lbs./ton	Undiluted	#2 Rougher Cell
Tri-Sodium Pyro Phosphate	Dispersant	.05 lbs./ton	10% Solution	#1 Cleaner Cell

powder inserted to break up the blocks for shipment.

Transportation

Market specifications require the product to be minus 3″ in size and packaged in 150 lb., 10 oz. jute burlap bags. The bags are loaded in box cars for shipment to Houston, Texas for export.

Tailings

Tailings from the rougher flotation cells flow by gravity to the tailings disposal area located adjacent to the mill. There is adequate ground available for this purpose, and the cost of impounding is very low.

Sampling

The company plans to install automatic sampling devices at the earliest possible date. At the present time, the heads are sampled manually at the mine by taking a 10 pound grab sample from each 8-ton truck load. An additional 2 pound head sample is taken every half hour from the pebble mill feed belt.

Concentrates are sampled at the thickener manually every half hour, ½ pound sample per cut. The same method applies in analyzing the tailings from the mill.

Power

The mill installation has a total of 229 connected motor horsepower. Actually, 160 horsepower is required for normal operation. The power comes from the Shoshone Dam located 4 miles up the canyon from the property and is purchased from REA at approximately $.02 per KW. Three 100 KW transformers are used to reduce the voltage to 440 volts.

Steam

Steam for the melting agitators is supplied by a 125 HP Wicks Water Tube Package Boiler set to deliver at 125 pounds per square inch pressure. This unit also supplies steam for heating the water used in the mill flotation process.

The mill water is heated by means of a series of plate coils installed in the 7′ x 6′ constant head water tank located above the pebble mill floor. Hot water is then piped by gravity to dilute the pebble mill feed and wash the discharge trommel screen, thereby diluting the rougher flotation feed to the correct solids ratio for flotation.

Supplementing the boiler installation is a package Zeolite Water Softening and Clarifying System which softens the water supplied to the boiler unit. This equipment is absolutely necessary, due to the hardness of the water from the nearby stream. Since the steam water is also frequently turbid, a small clarifying unit is used to clarify the feed to the Zeolite softening system.

Water

A 1½″ Model DN Worthington Pump delivers 120 gallons per minute to the 8′ x 10′ Constant Head Mill Water Tank against a 180′ total dynamic head from nearby Sulphur Creek. There is a possibility that Sulphur Creek will not be able to supply the complete mill requirements, averaging some 100 gpm during the summer months, in which case additional water will come from the Shoshone River.

Fuel

Natural gas rated at 1105 BTU per cu. ft. is available from a nearby field. The cost runs about $.06 per 1,000 cu. ft., depending upon the amount used. At present a total of 300,000 cu. ft. is needed and the source of supply is restricted to 225,000 cu. ft.

In view of this limitation, Wyoming-Gulf Sulphur is now making provisions to add an oil storage tank for storing No. 5 fuel oil rated at 18,000 BTU per pound. The cost of this oil will be about $.17 per gallon. Actually, when the boiler was originally installed the shortage of available natural gas caused some concern and combination gas and oil burners were installed with the unit.

Laboratory

A completely equipped batch laboratory is located in the office buildings on the property, and daily analyses are made to assure efficient and profitable operations.

Acknowledgment

The time and assistance given Deco Trefoil by members of the Wyoming-Gulf Sulphur Corporation in the preparation of this article is very much appreciated. We particularly want to express thanks to W. H. Marquette, president and general manager, who has been largely responsible for the successful development of this new operation.

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P. R. Smith Is Executive Secy. Of N. Y. State Organization

Paul R. Smith, who served as executive secretary of the Empire State Sand, Gravel and Ready Mix Association on a part-time basis during the year just past, was recently engaged as the organization's full-time executive secretary.

President of the association is Harry A. Barney, Barney & Dickenson, Inc., Vestal, N. Y. Other officers include the following: Leon H. Wendel, vice-president, Gasport Sand and Gravel Company, Lockport, N. Y.; William W. Nass, secretary, Syracuse Ready Mix Concrete Company, Inc.; and John Hopkins, treasurer, Albany Gravel Company, Albany 1, N. Y.

The following men are serving as directors: Harold A. Bundy, Bundy Concrete Company, Sherburne, N. Y.; R. W. Burgess, Mohawk Valley Concrete Company, Inc., Canajoharie, N. Y.; J. E. Cushing Jr., Cushing Stone Company, Schenectady, N. Y.; Harold Keahon, Keahon Bros., Inc., Pearl River, N. Y.; Frank L. Kelly, Colonial Sand & Stone Company, New York, N. Y.; Kenneth A. MacKenzie, MacKenzie Sand & Gravel, Clifton Springs, N. Y.; Edward J. Nunan, Buffalo Slag Company, Inc., Buffalo 3, N. Y.; Kenneth J. Premo, Massena, N. Y.; Ernest Z. Sly, Cortland Ready Mix Concrete Company, Cortland, N. Y.; and Harrison K. T. Voorhees, Elmira Transit Mix, Inc., Horseheads, N. Y.

Recruits for Engineering Sought Among U. S. Students

The current critical shortage in the United States of engineering manpower for industry and the defense effort has prompted The Advertising Council to accept an advertising campaign to urge qualified high school students to consider engineering as a career. Request for the campaign came from the Engineering Manpower Commission of the Engineers Joint Council.

The present shortage of engineers numbers 60,000. Industry alone needs at least 30,000 new engineers a year for normal replacement and growth. In a protracted national emergency, the annual requirement to fill the needs of industry and government would amount to about 40,000.

To help meet this situation, the Council's advertising campaign will point out to high school students and their parents the opportunities that exist in engineering today and in the years to come, and the advantages of engineering training in qualifying young men for positions of leadership in many fields. The first phase of the campaign will consist of radio and house magazine support, and the preparation of advertising materials for use by companies.

Noralyn Revisited

(*From page* 88)

ficient to keep the plant in full production for a minimum period of 25 years.

International's phosphate operations in Florida, Tennessee, and Montana are under the direction of Franklin Farley, vice-president of the company. Fred A. Koechlein is general manager of the Phosphate Division, and R. B. Fuller is manager of the Florida Division.

Economical Diesel-Powered Ripper Used in Crushing Hard Base Rock

The tractor-and-bulldozer team feeding the crusher at the Sondgroth Brothers Neary quarry operation. Beyond is the 30-in. by 118-ft. conveyor leading to the truck-loading bin.

SONDGROTH BROTHERS of Mountain View, Calif., primarily engaged in road-building and grading, some time ago leased the Neary quarry at Los Altos, Calif., for the production of road-base material.

The quarry has yielded thousands of tons of crusher-run-base rock, used by Sondgroth Brothers to fulfill a government contract for new runways at nearby Moffatt Field. In addition, considerable tonnage is sold to other contractors in the San Francisco bay area.

The deposit consists for the most part of hard base rock, which previously was broken by blasting. Seeking a more rapid, economical method of shattering the rock before feeding it to the crusher, the concern installed a Caterpillar No. 28 ripper, which has done a highly satisfactory job. Power is applied by three Caterpillar D8 diesel tractors —two pulling and one pushing. A No. 8U bulldozer is attached to one of the units afterward to feed the conglomerate to the crusher.

A grizzly spanning the hopper passes the minus 2-in. directly to a 36-in. by 118-ft. belt conveyor, while the grizzly rejects are chuted to a Pacific jaw-crusher set to break at about 1½ in. The crushed product joins the uncrushed throughs on the belt, all the output being delivered to a 100-cu. yd. truck-loading bin. Surplus is trucked to a storage pile, where an Allis-Chalmers HD5 loader serves delivery trucks. As much as 4,400 cu. yd. of finished material has been produced in 8 hours with this setup. About 10 percent usually requires crushing.

The company operates several of its own delivery combinations capable of carrying a total of about 25 tons in the truck body and trailer.

Established by John Sondgroth, now retired, about 20 years ago, the concern is now owned and managed by his five sons—Ed, Ralph, Tom, Vernon, and Harry. All were in the armed services during World War II with the exception of Ed. who was engaged as construction superintendent for Hass, Royce & Johnson in the building of the Alcan Highway.

Ripped material being 'dozed over an inclined grizzly where the plus 2-in. rock is broken by the jaw-crusher.

One of the diesel tractors and the ripper which breaks up base rock at the Neary quarry. In actual operation, however, two tractors pull and a third pushes the ripper to break up the hard material.

Passage of Solids Through Rotary Kilns

Factors Affecting Time of Passage

By W. C. SAEMAN*

(Reprinted by permission from *Chemical Engineering Progress*)

Equations based on theoretical considerations have been developed to give time of passage, axial transport velocity, bed depth, and other characteristics related to the passage of material through rotary kilns without flights. The equations are corrobrated by experimental data, and are particularly useful for evaluating the effects of constrictions in kilns and to calculate the bed depth in Roto-Louvre driers. This work fills a gap in the fundamental knowledge of kiln design and operation, and the theoretical equations may be used to supplant empirical methods of calculating kiln performance.

A RATHER extensive experimental study of the relation of time of passage of solids through rotary kilns to the measurable kiln variables was reported by Sullivan, Maier, and Ralston (*4*). The correlations that these authors made of their data are empirical, as are the correlations later proposed by other authors (*1, 2*).

The factors which affect the time of passage of material through a rotary kiln are quite obvious and have been identified in the reference cited above. These factors were related by simple, fundamental relations known to exist in rotary kilns to yield a theoretical analysis of this problem. This analysis, which is the subject of the present paper, resulted in development of an equation for time of passage through lightly loaded kilns that closely resembles the basic empirical one of Sullivan and co-workers, and also in development of equations that adequately express data for kilns with relatively heavy loads. The theoretically derived equations clarify several previously obscure characteristics of kiln operations, such as the effects of feed rate and constrictions on the time of passage, and are applicable to calculation of time of passage through Roto-Louvre type driers, which have tapered diameters.

Geometric Analysis of Factors

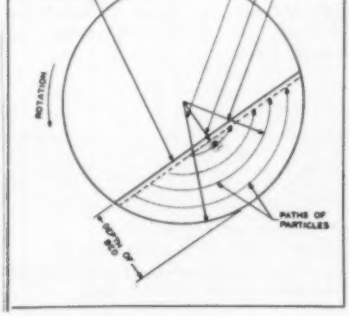
Development of Transport Velocity Equation. The path that a particle follows in traveling through a rotary kiln was described in detail by Sullivan, et al. (*4*). These investigators found that the position of a particle in the bed of material in a kiln remains stationary with respect to the kiln until it reaches a position close to the surface of the bed, and that from this point it cascades down along the bed surface in such a direction as to progress a short distance axially through the kiln and comes to rest at some lower position; the cycle is then repeated. The paths a particle may follow, based on this observation, are illustrated by Figure 1. Each possible path may be designated by the radius of the path and, as will be shown, the rate at which a particle progresses through the kiln (axial transport velocity) is dependent on the radius of the path followed and on several measurable quantities that are characteristic of the kiln and of the material. A particle generally does not follow the same path on successive cascades; but, in the considerations that will be made of the average behavior of all particles in the kiln, the variations in paths of individual particles will be of no significance since all the possible paths are obviously followed constantly by the same number of particles.

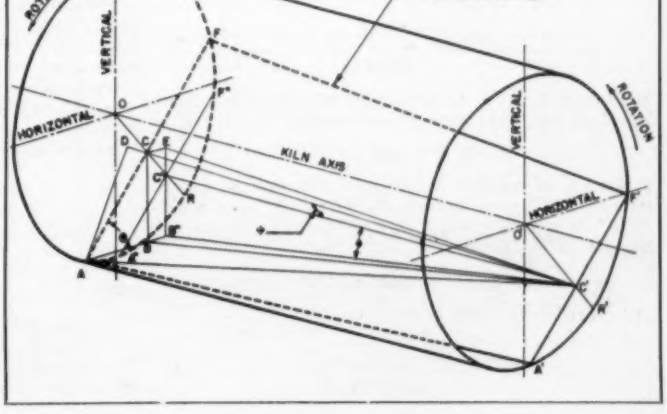
The axial transport distance of a given particle per cascade may be related to the path radius and to measurable variables as shown in the geometric construction in Figure 2. This construction represents a section of a rotating kiln between planes that cut the kiln axis perpendicularly through points O and O'. The kiln slopes downward from left to right, and the bed depth decreases in the same direction. Line AF is the intersection of the bed surface with plane O, and $A'F'$ is the intersection of that surface with plane O'. Points C and C' are the midpoints of AF and $A'F$, respectively. The length of the kiln section shown is such that line AC', which lies in the bed surface, is a horizontal line. The derivations that are to follow are based on the postulate that particles cascading down the bed surface under the action of gravity will cascade in a direction that is perpendicular to this horizontal line AC'. The particle that will be con-

*Present address: Tennessee Valley Authority, Wilson Dam, Ala.

Fig. 1. Below: Cross section of rotary kiln, showing paths followed by particles.

Fig. 2. Right: Projection of a rotary kiln section, showing geometry for the derivation of the axial transport rate of a particle.





sidered is one that cascades along line DA, which was constructed in the plane of the bed surface and perpendicular to AC'. Point D, which is on CC' extended, represents the midpoint of this particle's cascade if it is assumed that the particle cascades from kiln wall to kiln wall. The path of this particle may be designated by its radius OR, which is the kiln radius. It is pointed out, however, that similar geometric constructions apply to particles with paths of any radius, r; a particle with a path corresponding to the kiln radius was chosen for the present consideration only to simplify Figure 2.

One-half of the axial transport distance of the particle per cascade is represented by DC. From trigonometry we have

$$DC = \frac{(AC)^2}{CC'} \tag{1}$$

The length CC', is not a directly measurable quantity; however, it may be related to measurable quantities by appropriate methods as shown below.

In Figure 2, line $A'F'$ was projected onto plane O as line $A''F''$. Point C'' is the midpoint of $A''F''$ and, consequently coincides with projection of point C' onto plane O, and line $C'C''$ is parallel to the kiln axis. Line AB'' is the intersection of plane O with a horizontal plane through the previously described horizontal line AC'. The angle between this horizontal plane and the surface of the material is the angle of repose of the material as defined (*4*). In the figure, this angle is equal to the angle between line AD and the horizontal plane and is approximately equal to θ, which is the angle CAB''. Point B'' lies in a vertical plane through line $C'C''$ thus, angle $C''C'B''$ represents the angle of the kiln axis with the horizontal and is equal to the slope of the kiln. The angle $CC'C''$ is the angle between the surface of the bed and the kiln axis measured in a plane perpendicular to the surface of the bed.

Returning now to the problem of relating CC' to measurable variables, passage of a vertical plane through line CC' gives intersections that form triangle $CC'B$ and from the law of sines,

$$CC' = CB\frac{\sin CBC'}{\sin CC'B} \tag{2}$$

Further consideration of the figure shows that $CB = AC \sin \theta$. Also, since angle CBC' is approximately a right angle,

$$\sin CBC' = 1 \text{ *}$$

Thus, the Equation (2) may be rewritten

$$CC' = AC\frac{\sin \theta}{\sin CC'B} \tag{3}$$

Since angle $CC'B$ is the same order of magnitude as the kiln slope, and is therefore generally small,

$$\sin CC'B = \text{angle } CC'B''$$

Projection of triangle $CC'B$ onto the vertical plane through $C'C''$ gives triangle $EC'B''$ which, since angle $BC'B''$ is generally small, is approximately similar to triangle $CC'B$. Thus,

$$\sin CC'B = \text{angle } EC'B''$$

and Equation (3) may be rewritten

$$CC' = AC\frac{\sin \theta}{\text{angle } EC'B''} \tag{4}$$

From the construction in Figure 2, angle $CC''E = \theta$, thus,

$$\cos \theta = \cos CC''E = \frac{\tan EC'C''}{\tan CC'C''}$$

Since angles $EC'C''$ *and* $CC'C''$ are generally small,

$$\tan EC'C'' = \textit{angle } EC'C''$$

and,

$$\tan CC'C'' = CC'C''$$

thus,

$$\text{angle } EC'C'' = \cos \theta \text{ angle } CC'C'' \tag{5}$$

The angle $EC'C''$ in Equation (5) plus angle $C''C'B''$ is equal to angle $EC'B''$ in Equation (4). The latter equation may therefore be rewritten as

$$CC' = \frac{AC \sin \theta}{\text{angle } C''C'B'' + \cos \theta \text{ angle } CC'C''} \tag{6}$$

Substitution of this expression for CC' in Equation (1) gives,

$$DC = \frac{AC\ (\text{angle } C''C'B'' + \cos \theta \text{ angle } CC'C'')}{\sin \theta}$$

Substitution of simplified symbols in this equation gives the following expression for the axial transport distance per cascade:

$$x_c = \frac{c\ (\phi + \psi \cos \theta)}{\sin \theta} \tag{7}$$

where

x_c = axial transport distance of particle per cascade ($x_c = 2DC$)

*The symbol = indicates an approximate equality.

c = length of chord at surface of bed ($c = 2AC$)
ϕ = slope of kiln (angle $C''C'B''$), radians
ψ = angle between surface of material and kiln axis (angle $CC'C''$), radians
θ = angle of repose of material (approximately)

The average transport velocity of a particle for a specific path in the kiln is equal to the product of the displacement of the particle for a single cascade and the number of cascades per unit time. The number of cascades per unit time is equal to the product of the speed in revolutions per unit time and the number of cascades per revolution. The number of cascades per revolution may be expressed as:

$$N = \frac{\pi}{\sin^{-1}\frac{c}{2r}} \tag{8}$$

where

N = number of cascades per revolution
r = radius of particle path in bed (see Fig. 1)

The product of Equation (7), Equation (8), and the kiln speed gives the average transport velocity; thus,

$$u = nc\left(\frac{\phi + \psi\cos\theta}{\sin\theta}\right)\left(\frac{\pi}{\sin^{-1}\dfrac{c}{2r}}\right) \tag{6}$$

where

u = average axial transport velocity of a single particle
n = speed of kiln

Application of Equation to Calculation of Time of Passage Through Lightly Loaded Kilns. For lightly loaded kilns, the angle

$$\sin^{-1}\frac{c}{2r}$$

is approximately equal to the ratio $c/2r$. Using this approximation in Equation (9) gives,

$$u = 2\pi rn\left(\frac{\phi + \psi\cos\theta}{\sin\theta}\right) \tag{10}$$

The length of the kiln divided by u gives the time of passage,

$$t = \frac{L\sin\theta}{2\pi rn\,(\phi + \psi\cos\theta)} \tag{11}$$

where

t = average time of passage of a single particle
L = length of kiln

In actual practice, lightly loaded kilns usually operate with essentially uniform bed depth along their length, and effects of nonuniformity such as result from droop at the discharge end of the kiln are small and can be neglected. For cases of this kind, the angle ψ in Equation (11) is zero and the time of passage of a particle following a path of radius r is

$$t = \frac{L\sin\theta}{2\pi rn\phi} \tag{12}$$

For the lightly loaded kiln, the effective average radius of the particle paths closely approaches the kiln radius R, which may therefore be substituted for r in Equation (12). With such a substitution, Equation (12) corresponds closely to the basic empirical formula of Sullivan, et al. (4) for lightly loaded kilns; their equation was

$$t = \frac{1.77L\,(\theta^\circ)^{1/2}}{2Rn\phi^\circ} \tag{13}$$

where

t = time of passage through kiln, min.
L = length of kiln, ft.
θ° = angle of repose of material, deg.
R = kiln radius, ft.
n = speed of kiln, rev./min.
ϕ° = slope of kiln, deg.

The difference in the functional form of θ in Equations (12) and (13) does not have a pronounced effect on calculated values of the time of passage, since θ normally varies between relatively narrow limits (angle of repose usually varies between 35° and 45°).

The similarity of Equations (12) and (13) may be shown by consideration of the case where $\theta = 40°$. The time of passage based on the empirical equation is

$$t = \frac{11.2L}{2Rn\phi^\circ}$$

This compares closely to the time of passage calculated from the theoretically derived equation, which is

$$t = \frac{11.7L}{2Rn\phi^\circ}$$

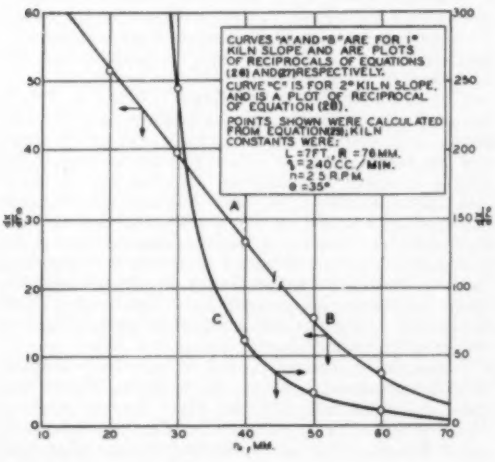
Since the basic empirical formula of Sullivan, et al. summarizes the bulk of their experimental data for lightly loaded kilns, the agreement which is seen to exist between the empirical and theoretical relations shown above serves as experimental confirmation of the validity of the theoretical analysis that has been presented thus far in the present paper.

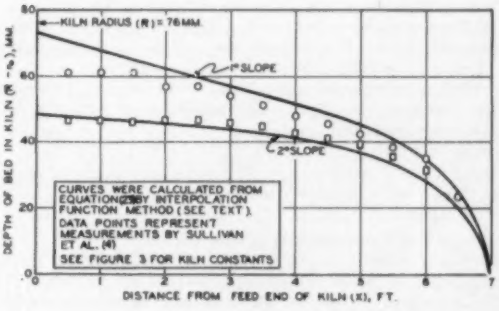
Extension of Relations for a Single Particle to a Volumetric Rate Basis

Development of General Equation. For relatively heavy kiln loads the approximation

Fig. 3. Left: Interpolation curves for Equation (23).

Fig. 4. Below: Comparisons of calculated and measured bed depths for conditions that give significant droop in bed depth.


CURVES "A" AND "B" ARE FOR 1° KILN SLOPE AND ARE PLOTS OF RECIPROCALS OF EQUATIONS (26) AND (27) RESPECTIVELY.
CURVE "C" IS FOR 2° KILN SLOPE, AND IS A PLOT OF RECIPROCAL OF EQUATION (28).
POINTS SHOWN WERE CALCULATED FROM EQUATIONS (23), KILN CONSTANTS WERE:
L = 7FT., R = 78 MM.
Q = 240 CC./MIN.
n = 2.5 R.P.M.
θ = 35°
A
B
C
ξ, MM.


KILN RADIUS (R) = 78 MM.
1° SLOPE
2° SLOPE
CURVES WERE CALCULATED FROM EQUATION (23) BY INTERPOLATION FUNCTION METHOD (SEE TEXT).
DATA POINTS REPRESENT MEASUREMENTS BY SULLIVAN ET AL. (4)
SEE FIGURE 3 FOR KILN CONSTANTS
DEPTH OF BED IN KILN (R − η), MM.
DISTANCE FROM FEED END OF KILN (X), FT.

$$\sin^{-1}\frac{c}{2r} = \frac{c}{2r}$$

used in Equation (10) is no longer valid. Equation (9) may, however, be extended, as described below, to a form that is applicable to rotary kilns with heavy loads and with variable bed depth.

Equation (9) expresses the rate of transport of a particle as a function of the radius of the path of the particle. This equation can be transformed to a volumetric basis by multiplying each side by the increment of area associated with the path r. The increment of area is

$$dA = 2r \sin^{-1}\frac{c}{2r}\,dr \qquad (14)$$

Multiplying Equation (9) by Equation (14) gives

$$udA = nc\left(\frac{\phi + \psi\cos\theta}{\sin\theta}\right)\left(\frac{\pi}{\sin^{-1}\dfrac{c}{2r}}\right)\left(2r\sin^{-1}\frac{c}{2r}\right)dr$$

which simplifies to

$$udA = 2\pi rnc\left(\frac{\phi + \psi\cos\theta}{\sin\theta}\right)dr \qquad (15)$$

The length of the chord, c, may be expressed as a function of the path radius by

$$c = 2\,(r^2 - r_0^2)^{1/2} \qquad (16)$$

where r_0 is the path in the bed of material having the shortest radius (see Fig. 1). Substituting Equation (16) in Equation (15) gives

$$udA = 4\pi n\left(\frac{\phi + \psi\cos\theta}{\sin\theta}\right)(r^2 - r_0^2)^{1/2}\,r\,dr \qquad (17)$$

Since the transport velocity and weight of material associated with each path remain unchanged whether or not the material follows the same path consistently on successive cascades, the average volumetric transport rate, q, may be obtained by direct integration of Equation (17) from $r = r_0$ to $r = R$, or

$$q = \frac{4\pi n}{3}\left(\frac{\phi + \psi\cos\theta}{\sin\theta}\right)(R^2 - r_0^2)^{3/2} \qquad (18)$$

where q = volumetric transport rate in the kiln.

It should be noted that the shortest radius path, r_0, does not coincide exactly with the surface of the material but differs from it by the thickness of the cascading layer of material which, however, is usually negligible.

The volumetric transport rate, q, is related to the average transport velocity at a given point in the kiln by the following equation

$$u_{AVG} = \frac{q}{A} \qquad (19)$$

where A = cross-sectional area of the bed.

For a given r_0, either measured or calculated from Equation (18), the cross-sectional area of the bed may be calculated or may be obtained from handbook tabulations (3). If the depth of the bed is essentially constant along the length of the kiln, the bed cross section is constant and the average time of passage of material through the kiln is

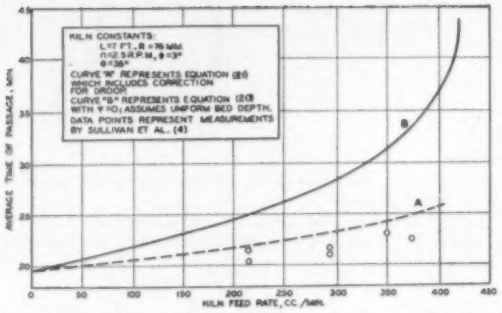

KILN CONSTANTS:
L=7 FT., R = 78 MM.
n=2.5 R.P.M., θ=3°
β=35°
CURVE "B" REPRESENTS EQUATION (20) WHICH INCLUDES CORRECTION FOR DROOP
CURVE "A" REPRESENTS EQUATION (20) WITH Y=0; ASSUMES UNIFORM BED DEPTH.
DATA POINTS REPRESENT MEASUREMENTS BY SULLIVAN ET AL. (4)
AVERAGE TIME OF PASSAGE, MIN.
KILN FEED RATE, CC./MIN.
A
B

Fig. 5. Comparison of calculated and measured effects of kiln feed rate on time of passage.

$$t = \frac{LA}{q} \qquad (20)$$

If, however, the cross-sectional area does not remain constant along the length of the kiln, Equation (20) must be written in differential form,

$$dt = \frac{A\,dx}{q} \qquad (21)$$

From which the total time of passage can be obtained by integration.

Determination of Maximum Kiln Capacity. The volumetric transport rate at any point in a kiln as a function of r_0 at that point is given by Equation (18). Differentiation of this equation with respect to r_0 gives

$$\frac{dq}{dr_0} = -4\pi n\left(\frac{\phi + \psi\cos\theta}{\sin\theta}\right)(R^2 - r_0^2)^{1/2}r_0 \qquad (22)$$

If dq/dr_0 is equated to zero, the resulting equation is satisfied by $r_0 = R$ and $r_0 = 0$. It is obvious that the solution $r_0 = R$ corresponds to the minimum volumetric transport rate, $r_0 = 0$ corresponds to the maximum transport rate. This result indicates that the maximum volumetric transport rate through a kiln is obtained by operating with the bed depth in the kiln equal to the kiln radius.

Time of Passage Where Bed Depth Is Uniform. Where the depth of the bed in a kiln is uniform along the kiln length, ψ in Equation (18) is zero, r_0 remains constant, and the equation can be solved directly for any of the factors involved. Experimental corroboration of Equation (18) for uniform bed depth is provided by data for the uniformity loaded section of a kiln reported by Sullivan, et al. (4). This corroboration is discussed below.

Bed depths measured by the above-mentioned authors in the uniformly loaded section of an experimental kiln under various operating conditions are tabulated in Table 1, together with values calculated for the same conditions by use of Equation (18).

It may be seen that for the 267 cc./min. feed rate there is close agreement between the measured depths and those calculated from Equation (18). For the relatively low feed rate of 25 cc./min., the bed depths calculated by use of Equation (18) are significantly smaller in all cases

Table 1.—Measured and Calculated Values for Uniform Bed Depth in an Experimental Kiln at Various Slopes*

	Depth of Bed, mm.				
	Nominal Feed Rate, 267 cc./mm.		Nominal Feed Rate, 25 cc./mm.		
Kiln Slope, Degrees	Measured†	Calculated from Equation (18)	Measured†	Calculated from Measured Time of Passage and Feed Rate	Calculated from Equation (18)
1	....	....	14.7	11.7	13.2
2	....	....	11.3	7.5	8.0
3	34.6	37.4	10.8	5.7	6.0
4	28.6	28.8	7.6	4.8	5.0
5	25.4	24.6	....	....	....
6	22.9	21.2	....	....	....

* Experimental data of Sullivan, et al. (4). Kiln was 7 ft. long by 76 mm. radius and was rotated 2.5 rev./min. Angle of repose of material was 35°.
† Depth measured with kiln in motion.

than the depths measured directly by Sullivan, et al. However, the former are in good agreement with the depths (see Table 1) calculated from time of passage and feed rates measured by those authors, which indicates that time of passage calculated by use of Equation (18) in conjunction with Equation (20) would agree closely with measured time of passage.

Time of Passage Where Bed Depth Is Not Uniform. Nonuniform depth of material occurs in a kiln near the discharge end and above constrictions. In cases where the bed is relatively deep, reliable calculations of time of passage by use of Equation (18) can be made only by substitution of appropriate values for ψ, the slope of the bed with respect to the kiln axis, along the entire kiln length. For such calculations, ψ can be expressed in terms of the variation of r_0 along the length of the kiln; thus,

$$\psi = \frac{dr_0}{dx}$$

Substitution of dr_0/dx for ψ in Equation (18) gives the differential equation

$$\frac{dr_0}{dx} = \frac{3q \sin\theta}{4\pi n \cos\theta\,(R^2 - r_0^2)^{3/2}} - \frac{\phi}{\cos\theta} \qquad (23)$$

Although the variables in this equation are separable, the formal integral solution of the equation is difficult. For the particular case where $\phi = 0$ the variables in Equation (23) reduce to the following standard form for integration:

$$\int (R^2 - r^2)^{3/2} dr =$$

$$\frac{r}{4}(R^2 - r^2)^{3/2} + \frac{3R^2 r}{8}(R^2 - r^2)^{1/2} + \frac{3R^4}{8}\sin^{-1}\frac{r}{R} = f(r)$$

Using this integral in Equation (23) gives

$$\frac{4\pi n \cos\theta}{3q \sin\theta} f(r) = x + C \qquad (24)$$

where C is the constant of integration. Equation (24) can be manipulated to yield a solution involving the slope, ϕ, but the work becomes more tedious than the solution to this problem warrants, since the applicability of Equation (23) itself becomes more and more questionable as the value of dr_0/dx becomes large due to the approximations involved in the derivation. At the discharge end of a kiln where droop in the bed reaches its maximum value, it is obvious that the inclination of the surface relative to the horizontal will not exceed the angle of repose of the material. This limitation establishes the contour of the surface of the material in the kiln independently of Equation (23). In the final solution the values of r_0 from Equation (23) should merge smoothly with the limiting value at the end of the kiln, which is equal to the angle of repose reduced by an amount equal to the slope of the kiln ($\psi = \theta - \phi$). This can be conveniently done by graphical methods. Other approximate solutions can readily be obtained by series approximation, or by numerical integration using appropriate interpolation formulas.

The validity of Equation (23) was checked against the data of Sullivan, et al. for cases where they incurred large droop effects in their kiln loading. In making this check, the interpolation formula method was used for integrating Equation (23) as follows. Equation (23) was represented in general form as

$$\frac{dr_0}{dx} = \frac{1}{F(r_0)} \qquad (25)$$

where $F(r_0)$ is an appropriate interpolation function so that $\int F(r_0)\,dr_0$ can be readily evaluated. Appropriate interpolation functions, $F(r_0)$, were then obtained by plotting values of the reciprocal of dr_0/dx, calculated from Equation (23), vs. r_0 as is shown in Figure 3, drawing curves through these plotted points, and then approximating these curves by arbitrary algebraic functions which could be easily integrated. The specific functions with the limits of validity for the function used for a 1°-kiln slope were:

$$\frac{dr_0}{dx} = \frac{1}{77 - 12.5r_0} \quad (0 < r_0 < 45 \text{ mm.}) \qquad (26)$$

and

$$\frac{dr_0}{dx} = \frac{1}{2.5 + 2(7.5 - r_0)^2} \quad (45 \text{ mm.} < r_0 < 75 \text{ mm.}) \qquad (27)$$

That used for a 2° kiln slope was:

$$\frac{dr_0}{dx} = \frac{1}{1.6r_0 + \dfrac{140}{r_0 - 2.5} - 39} \quad (25 < r^\circ < 75 \text{ mm.}) \qquad (28)$$

Equations (26)-(28) were then integrated to give expressions for depth of bed as a function of position in the kiln. Curves representing the integrated equations are shown in Figure 4, together with the observed values of the depth of bed reported in (4). Although Equation (23) is not valid at the discharge end, where the bed depth decreases rapidly, it is seen that the length of the section in which this rapid decrease occurs is so short that it is of little or no value to know either the length in which this occurs or the value of ψ over this length. For practical purposes, it suffices to set $r_0 = R$ at the discharge end of the kiln. Inside the kiln, r_0 approaches tangentially the value of r_0 for uniform bed depth calculated by Equation (18) when $\psi = 0$. For practical purposes, the difference between the value of r_0 obtained from Equation (23) and that from Equation (18) for $\psi = 0$ can be neglected as soon as the two values of r_0 agree within practical limits, and it may be said that uniform loading is reached at that point in the kiln. The value of $R - r_0$ calculated for uniform loading for the

2° slope shown in Figure 4 is 52 mm., which is only slightly greater than the feed-end value, 48 mm.; this indicates that uniform loading was almost reached. It was shown earlier that the maximum kiln capacity is reached with a depth of bed equal to the radius of the kiln. The capacity for uniform loading of the kiln used by Sullivan, et al. calculated by Equation (18) for a 1° slope is 142 cc./min. The rate used, 240 cc./min., was actually in excess of this, which means that ψ must take on a value of sufficient magnitude to give the required transport rate, as is shown by the plot of the theoretical equation in Figure 4. Since the depth of the bed is extremely sensitive to small fluctuations in experimental conditions when the depth of bed is nearly equal to the kiln radius, the differences between the observed and calculated values shown in Figure 4 are not considered excessively large.

Effect of Feed Rate on Time of Passage. Time of passage of material through a kiln is related to the feed rate and to the cross-sectional area of the bed by Equation (20)

$$t = \frac{LA}{q}$$

in which A and q are mutually dependent on r_0. Since dq/dr_0 was shown by Equation (22) to diminish as r_0 decreases, whereas dA/dr_0 increases as r_0 decreases, it is obvious that increases in the kiln feed rate, q, should result in increases in the time of passage and that these increases should be more pronounced at relatively high feed rates.

Only slight effects of kiln feed rate on time of passage were indicated by data (*4*). Comparison of the effects of feed rate indicated by these data with effects calculated for the same conditions by use of the theoretical equations is provided in Figure 5. This figure shows that there is reasonably close agreement between the observed values of time of passage at various feed rates and values calculated from Equation (23), which includes correction for droop in the bed. On the other hand, calculation of time of passage through the experimental kiln, assuming uniform loading, results in a curve (Fig. 5) that shows a relatively large effect of feed rate on time of passage. It is evident, therefore, that the conditions of the experiment by Sullivan, et al. were such that the effect of droop in bed depth largely counteracted the effect of feed rate on time of passage. It is expected that, with a relatively long kiln, the effect of droop on time of passage would be less and the relative effect of feed rate would be greater than the effects noted in the experimental kiln of the authors mentioned.

Time of Passage Through Kilns with Constrictions. For any rotary kiln operating under steady conditions, the volumetric transport rate, q, is the same at all points along the kiln length; thus, as is apparent from Equation (21), a constriction can alter the time of passage only by altering the bed cross-sectional area over a significant portion of the kiln length. Equation (23) is applicable to determination of the effects of several types of kiln constrictions on time of passage, as will be described below.

For thin, diaphragm-type constrictions and where the normal* depth of material at the point of the constriction would be less than the height of the constriction, the depth of bed immediately above the constriction is approximately equal to the height of the constriction, and the bed depth gradually decreases above the constriction. The value of r_0 at the constriction is therefore equal to the radius of the constriction and serves as the terminal condition for solving Equation (23) for the depth of bed above the constriction until uniform loading is reached. The bed depth below a constriction of this type is not affected by the constriction, and time of passage through this section can be calculated as for a kiln without constriction. For thin constriction with a height less than normal bed depth at the point of constriction, it is obvious that there would be no significant effect on time of passage of material through the kiln since neither R nor r_0 are altered over any appreciable distance.

A broad-type constriction alters the effective kiln radius for a relatively large portion of the kiln length; thus, the height of this type of constriction need not exceed the normal bed depth to have a significant effect on the time of passage. The time of passage through kilns equipped with such constrictions may be calculated by applying the theoretically derived equations separately to (a) the kiln section below the constriction, (b) the constricted section and (c) the kiln section above the constriction. Calculation for the section below the constriction may be made as was described for kilns without constrictions. For the constricted section, Equation (21) may be used with R equal to the constriction radius and with the terminal value of r_0 at the lower end of the constricted section equal to the smaller of either (a) the constriction radius or (b) r_0 calculated for the uppermost point in the section below the constriction. Calculation of time of passage through the kiln section above the broad constriction may be made using $R =$ kiln radius and using a terminal value of r_0 at the lower end of the section equal to r_0 calculated for the uppermost point in the constricted section. This terminal value of r_0 exceeds the normal bed depth for this point in the kiln; thus, bed depth above the constriction will decrease to the value of uniform loading.

It is indicated from the analyses given above that changing the position of a kiln constriction should not affect time of passage through the kiln so long as the bed depth above the constriction is permitted to reach a constant value and so long as uniform loading exists below the constriction. If the constriction is placed so close to the feed end that uniform loading is not reached above the constriction, the lengthening of retention time by the constriction will be less than if it were placed farther down the kiln. If the constriction is placed so close to the discharge end that it interferes with the normal droop, the lengthening of retention time by the constriction will be somewhat greater than if it were placed farther up the kiln.

An example involving Equations (12) and (23), together with the general relations represented by Equations (20) and (21), deals with the calculation of the time of passage through an industrial nodulizing kiln in which the equivalent of a broad constriction exists. Sand and clay are heated to incipient fusion in the kiln to agglomerate the mixture into coarse aggregates or nodules. The kiln diameter is less in the combustion zone than in the remainder of the kiln due to the use of thicker brick lining and the accumulation of partially fused material on the walls. The fused material is cut from the walls periodically with a heavy cutting bar. The dimensions and operating conditions of the kiln are:

Length, ft.	125
Shell diam., ft.	8
Inside diam., combustion zone, ft.	6.5
Thickness of fused layer (approximate),	

*"Normal bed depth," as used here, refers to the bed depth that would exist without a constriction in the kiln.

ft.	0.15
Inside diam., feed end, ft.	7
Length of 7-ft. diam. section, ft.	80
Rotation, rev./min.	3
Slope, in./ft.	0.5
Feed rate, cu.ft./min.	6.1
Angle of repose, degrees	45
Measured time of passage, min.	40

Since the conditions affecting the time of passage vary along the kiln, separate calculations must be made for each set of conditions affecting the time of passage. The time of passage for uniform loading through the 80-ft. section at the feed end can be calculated with Equation (12) since the bed is relatively shallow.

$$t = \frac{(80\text{ ft.})\ (\sin 45)}{2\pi\ (3.5\text{ ft.})\ (3/\text{min.})\ (1/24)} = 20.5\text{ min.}$$

Equation (12) is also used to calculate the time through the 6.5-ft. diam. section in the combustion zone.

$$t = \frac{(45\text{ ft.})\ (\sin 45)}{2\pi\ (3.1\text{ ft.})\ (3/\text{min.})\ (1/24)} = .13\text{ min.}$$

In the lower end of the 80-ft. section the bed builds up due to the reduced diameter of the combustion zone. The volume of this build-up divided by the volumetric feed rate gives the time which must be added to the two values calculated above to give the total time of passage. The extent of the build-up is calculated by Equation (23) using an interpolation formula for the solution, as exemplified by Equation (25). The depth of the bed in sections of the kiln where the bed depth is uniform is given implicitly by Equation (18), and is found to be 0.64 ft. for the 80-ft. section and 0.74 ft. for the 45-ft. section. The values of r_0 for these two sections are 2.86 ft. and 2.36 ft., respectively. The variation of ψ upstream from a constriction varies only slightly in contrast to the strong variation associated with droop at the discharge end. Because of this, close approximations in the solution of Equation (23) are more easily made.

For this case it is adequate to determine ψ at three points. For values of r_0 equal to 2.86, 2.66, and 2.36 feet the values of ψ (dr_0/dx) calculated from Equation (23) are 0, —0.017, and —0.031, respectively. An interpolation curve passing through these points and giving approximate values of dr_0/dx for values of r_0 between 2.36 and 2.86 ft. is given by the formula

$$\frac{dr_0}{dx} = -\frac{1}{14 + \dfrac{9}{2.86 - r_0}}$$

The solution of this equation giving x as a function of r_0 is

$$x = 1.9 - 14r_0 + 9\ ln\ (2.86 - r_0)$$

The build-up in the bed can now be plotted and determined graphically. It is found to be about 50 cu. ft. in excess of that for uniform loading. Since the volumetric feed rate is 6.1 cu. ft./min., the extension in time of passage due to this build-up is about 8 min. The total calculated time is therefore 41.5 min. and agrees closely with the measured value of 40 min.

Time of Passage Through Roto-Louvre Driers. Calculation of time of passage through Roto-Louvre type driers presents a special problem because of the tapered diameter characteristic of this type of drier. However, the theoretical relations that have been developed are readily adaptable to calculations relative to the Roto-Louvre-type drier as is illustrated in the following example.

Given: A Roto-Louvre drier with dimensions and operating conditions as follows:

Length, ft.	40
Feed end diameter, ft.	6.6
Discharge end diameter, ft.	10
Depth of bed at feed end, ft.	2.0
Feed rate, cu. ft./min.	12.5
Speed, rev./min.	3
Slope	Zero
Angle of repose of material, deg.	43

Sought: The relation of depth of material in the drier to distance from feed end of drier. (Such a relation would permit determination of average time of passage by application of Equation (21).)

The drier radius as a function of x is given by

$$R = 3.3 + 0.0425x \qquad (29)$$

Since r_0 is expected to vary over a relatively small range only, it can be approximated as a function of x by a general power series of the type

$$r_0 = A + Bx + Cx^2 + Dx^3 + \ldots \qquad (30)$$

The derivative, dr_0/dx, is thus

$$\frac{dr_0}{dx} = B + 2Cx + 3Dx^2 + \ldots \qquad (31)$$

If Equations (29), (30), and (31) are substituted in Equation (23), the values of the constants A, B, C, etc., can be evaluated at $x = 0$ by successive differentiation of the equation. This substitution gives (neglecting higher terms in the series):

$$(B + 2Cx + 3Dx^2 + \ldots) = \frac{-\phi}{\cos\theta} + \frac{3q\sin\theta}{4\pi n\cos\theta}\left[\frac{1}{(3.3 + 0.0425x)^2 - (A + Bx + Cx^2 + Dx^3 + \ldots)^2}\right]^{1/2} \qquad (32)$$

Since $\phi = 0$, the term involving it drops out. At $x = 0$ (feed end) $A = r_0$ or 1.3 feet. Substituting $A = 1.3$ in Equation (32) and solving for B, it is found that $B = 0.0331$. Differentiation of Equation (32) permits the calculation of C at $x = 0$ from the values of A and B already found. The value of D can be found likewise by differentiating a second time. Repetition of this procedure leads to a general series solution of the problem. For a converging series, as obtained in this case, the number of terms required depends on the accuracy desired. The solution found up to terms in x^3 is

$$r_0 = 1.3 + 0.0331x - 0.000524x^2 + 0.00000663x^3 - \ldots \qquad (33)$$

Since the value of the x^3 term at 40 ft. is only 0.4 ft. and since the series converges and is alternating, the error which results from neglecting terms higher than x^2 is less than 0.4 ft. in this case. The depth of bed at the discharge end is therefore

$$5 - (1.30 + 1.32 - 0.84 + 0.42 - \ldots) = 2.8\text{ ft.}$$

This depth will, of course, exist only if the discharge end has a barrier to retain a 2.8-ft. bed in the drier. If the barrier at the discharge end is not this high, it will be the controlling radius in the drier and will serve as a starting point for calculating the depth in other parts of the drier. In actual operation a barrier 2.7 ft. high was needed at the discharge end to establish the conditions

in the drier which were specified in the preceding problem.

For a second example involving the same drier with a feed rate of 9 cu. ft./min. and a barrier at the discharge end set to give a bed 2 ft. deep, the solution of Equation (32) will be repeated in a slightly different form which simplifies the work by reducing the number of terms required in the power series approximation. In the following calculation the series will be limited to three terms and the constants in Equation (32) will be represented by the letter F giving

$$\frac{dr_o}{dx} = B + 2Cx = F[(a + bx)^2 - (A + Bx + Cx^2)^2]^{-\frac{1}{2}} \tag{34}$$

The second derivative, d^2r_o/dx^2, is obtained by differentiating Equation (34) as follows:

$$\frac{d^2r_o}{dx^2} = 2C = -\frac{3F}{2}$$
$$[(a + bx)^2 - (A + Bx + Cx^2)^2]^{-\frac{5}{2}}$$
$$[2b(a + bx) - 2(B + 2Cx)(A + Bx + Cx^2)] \tag{35}$$

The constants B and C are obtained from Equations (34) and (35) by setting all factors of x equal to zero, giving

$$B = F[a^2 - A^2]^{-\frac{1}{2}} \tag{36}$$

and

$$C = -\frac{3F}{2}[a^2 - A^2]^{-\frac{5}{2}}[ab - AB] \tag{37}$$

Since the three-term series approximation is valid only for relatively small values of x, the error in the approximation must be estimated in order to insure calculations of sufficient accuracy. Since the series is found to be converging and alternating, the last term will indicate the approximate size of the error involved. The largest value of x used must therefore be limited, so that the last term does not exceed the tolerable error in the calculation. For values of x beyond the limiting value, a new set of constants may be calculated for the three-term series approximation. This step-wise procedure may be repeated as often as needed to extend the calculation over the full length of the drier. For the conditions of this problem the factors F, a, b, and A have the values 0.67, 5, 0.0425, and 3, respectively, giving values for B and C equal to 0.0104 and —0.0002, respectively. For the initial step the origin of x will be located at the discharge end and the distance towards the feed end will be considered negative. The initial series for r_o is,

$$r_o = 3 + 0.0104x - 0.0002x^2 \tag{38}$$

Values for r_o are 2.7 and 2.25 ft., respectively, for values of x equal to —20 and —40 ft. At —40 ft. (feed end) the x^2 term is 0.32 ft., indicating that the error in the approximation may be of this order. To obtain a more accurate value at the feed end the constants A, B, and C, can be recalculated at —20 ft. where the error in r_o is less than 0.08 ft. The new series with the origin for x located 20 ft. from the discharge end is

$$r_o = 2.7 + 0.0214x - 0.0004x^2 \tag{39}$$

For Equation (39) the value of r_o at x equal to —20 ft. (feed end) is 2.1 ft. and is in agreement with the measured value, which was 2.1 ft. also.

Summary

Theoretical equations for time of passage and bed depth in rotary kilns were derived from observations reported by Sullivan, et al. (*4*) together with observations made by the author on industrial kilns and Roto-Louvre driers. In the simplest case for lightly loaded kilns the time of passage is given by Equation (12),

$$t = \frac{L \sin\theta}{2\pi r n \phi}$$

and corresponds closely to the equation derived by the above mentioned authors on an empirical basis. For accurate calculations on heavy kiln loads the volume of the bed and time of passage must be calculated from the value of r_o given implicitly by Equation (18),

$$q = \frac{4\pi n}{3}\left(\frac{\phi + \psi\cos\theta}{\sin\theta}\right)(R^2 - r_o^2)^{\frac{3}{2}}$$

When ψ in Equation (18) is not equal to zero the problem involves the solution of the differential Equation (23),

$$\psi = \frac{dr_o}{dx}$$
$$= \frac{3q\sin\theta}{4\pi n\cos\theta}R^2 - r_o^2)^{-\frac{1}{2}} - \frac{\phi}{\cos\theta}$$

Several practical methods of solution for this equation are illustrated. The theoretical equations are corroborated by experimental data (*4*), together with data from industrial kilns and Roto-Louvre driers. The analysis clarifies previously obscure effects of the feed rate and constrictions on the time of passage through rotary kilns.

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Notation

(Applicable to any set of consistent units)

A = cross-sectioned area of bed
c = length of chord at surface of bed
D = kiln diameter L = length of kiln
N = number of cascades per revolution
n = speed of kiln
q = volumetric transport rate in kiln
R = kiln radius r = radius of particle path in bed
r_o = minimum radius path in bed
t = time, or time of passage through kiln
u = average axial transport velocity of a single particle
x = distance along kiln axis
x_c = axial transport distance of particle per cascade
θ° = angle of repose of material, degrees
θ = angle of repose of material, radians
ϕ° = slope of kiln, degrees ϕ = slope of kiln, radians
ψ = angle between surface of material and kiln axis, radians

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Report on Current Labor Developments

By S. HERBERT UNTERBERGER
Industrial & Labor Economists
Washington, D. C. — Philadelphia, Pa.

Wage Stabilization Information

After October 1st, employers will no longer be able to secure wage stabilization information, rulings, interpretations and forms from their local Wage and Hour Division offices. In an economy move required to conform with its reduced appropriation the Wage Stabilization Board has announced that it has been required to eliminate these services.

To partially compensate, the Wage Stabilization Board has established a small number of field offices in key cities. Future contacts should be made either with these field offices or directly with the Regional Wage Stabilization Boards. Their locations are as follows:

Region Number	Location of Regional Board	Location of Field Office
1	Boston, Mass.	Hartford, Conn.
		Providence, R. I.
2	New York, N. Y.	Newark, N. J.
		Buffalo, N. Y.
3	Philadelphia, Pa.	Pittsburgh, Pa.
4	Richmond, Va.	Baltimore, Md.
		Roanoke, Va.
		Raleigh, N. C.
5	Atlanta, Ga.	Nashville, Tenn.
		Birmingham, Ala.
		Miami, Fla.
		Savannah, Ga.
6A	Cleveland, Ohio	Cincinnati, Ohio
		Toledo, Ohio
		Louisville, Ky.
6B	Detroit, Mich.	
7	Chicago, Ill.	Indianapolis, Ind.
8	Minneapolis, Minn.	
9	Kansas City, Mo.	Des Moines, Iowa
		St. Louis, Mo.
		Omaha, Neb.
10	Dallas, Texas	Oklahoma City, Okla.
		Little Rock, Ark.
		New Orleans, La.
		Houston, Texas
11	Denver, Colo.	
12	San Francisco, Cal.	Phoenix, Ariz.
13	Seattle, Wash.	Portland, Ore.

Reduction in the Wage Stabilization Board's budget will also require the reduction of its Regional Boards from 12 to 6 members, the practical liquidation of its program (carried out by the Bureau of Labor Statistics) for gathering statistical data on wage practices for use in processing petitions, and progressive cuts in staff. All of this will probably mean that it will be much harder and take much longer to get an answer out of the Wage Stabilization Board, either in response to a question or to a formal petition for approval of a wage adjustment.

New Rules for Petitioning on Fringe Benefits

Particularly because of staff shortages, the Wage Stabilization Board has been requiring the petitioning employer and labor union to present complete justification for their requests. Accordingly it has been issuing very detailed instructions on how to apply for approval and is rejecting petitions which are not made out in accordance with those instructions. Its instructions on "fringe benefit" petitions which have recently been released relate principally to:

Paid vacations
Paid holidays
Premium pay relative to days and hours of work
Shift differentials
Call-in pay

Action by WSB

WSB, in acting on fringe benefit proposals, will use as a standard for comparison the practice of that grouping of establishments in the area or industry "most appropriate to the preservation of historical, traditional, or otherwise normal patterns of adjustment."

"Area practice" means the practice prevailing in varied industries within a particular local area, or in a geographic section, or throughout the country — whichever WSB deems most appropriate.

"Industrial practice" means the substantially uniform practice followed by a number of establishments in an industry operating in a particular local area, or in a geographic section, or throughout the country.

WSB may find that neither the "area practice" nor the "industry practice" standard is appropriate or applicable. This may happen when:

The proposed benefits are clearly of minor cost and will not be unstabilizing; or

The problem to which the fringe benefit relates is not generally encountered in the area or industry; or

Reimbursements are involved, reasonable in amount and type, for usual and recurring expenses arising out of and directly connected with the job.

Preparing the Supporting Statement

1. State your present practice with respect to fringe benefits under consideration.
2. State your proposal.
3. Justify the proposal by one of the following:

(a) State what "area practice" is with respect to the benefit(s) you propose (including the names of establishments, location, type of establishment (whether factory, mine, wholesaler, etc.), type of product or service, type and amount of the comparable fringe benefit(s) paid, estimated number of employees who receive the benefit, and their identity (i.e., whether office clerical workers, production workers, etc.); OR

(b) If you believe the "area practice" standard is not appropriate, state your reasons and present "industry practice" data (names of establishments, location, etc., as for "area practice" above); OR

(c) If the benefit(s) you propose is (are) not among the "major five," and you believe neither the "area practice" nor "industry practice" standard is applicable, substantiate your belief, and

(1) Outline the problem the proposed benefit is designed to solve or the circumstances that require in-

(*Continued on page* 109)

new machinery and supplies

● Truck Body Hoist

A line of "Dump It" hydraulic dump body hoists has been placed on the market by St. Paul Hydraulic Hoist, Minneapolis, Minn.

This line is designed especially for trucks of 128-in. wheelbase and longer with bodies to 20 ft. long. Six models are available to fit applications from 7- to 15-ton capacity.

The hoist has tension links on each side of the cylinder that absorb most of the dumping shocks and permit use of a flexible sub-frame, so that heavy loads do not bend the truck chassis when dumping. Other features of the hoist include low mounting height, safety overload valve, body hold-down latch, and long beams to reinforce the platform body.

● Moly-Manganese Electrodes

Electrodes for hand or automatic electric welding of moly-manganese are being produced by the Stoody Company, Whittier, Calif.

The electrodes are bare and have the following properties; Rockwell hardness 85-90 B; tensile strength 100,000 psi; yield strength 85,000 psi; elongation in 2 in. 14 percent; and non-magnetic deposits.

They are designed as build-up material for manganese parts. Sizes are 14 in. in length and 5/32, 3/16, and ¼ in. diameters.

● 60-Inch Gyratory Crusher

A "Symons" primary gyratory crusher with a 60-in. feed opening has just been manufactured by the Nordberg Manufacturing Company, Milwaukee 1, Wisc. The crusher is about 27 ft. high and 19 ft. in diameter with a weight of more than 1,000,000 lb.

It is claimed to be the largest crusher ever built in the gyratory style, and has a capacity in excess of 3,000 tons per hour.

● Torque Converter Cranes

The Unit Crane and Shovel Company, Milwaukee, Wisc., has announced that the Unit crawler and mobile machines of ½ yd. capacity are now equipped with Fluid Torque Drive. The system utilizes a Chrysler Torque Converter to give smoother operation and greater power. The engine clutch and lever system are eliminated but other features of the cranes remain the same.

The Unit with Fluid Torque Drive has been tested in shovel, dragline, clamshell, and trenchhoe operations with advantages of the torque converter being evidenced in each operation.

● Shovel Scoop Attachment

An attachment that converts the Lorain TL-25 turntable into a scoop shovel for loading operations has been placed on the market by the Thew Shovel Company, Lorain, Ohio.

The attachment consists of a short rugged boom 8 ft. 6 in. in length with a cable driven shipper shaft at the end. A double dipper stick is mounted to operate horizontally through rigid sleeves at the end of the boom. Pinions on the shipper shaft engage racks on the dipper stick to give a crowding motion to the dipper through a stroke of 7 ft.

The entire front end is raised for dumping by a hoist line and the dipper is dumped by a tripping release. The shovel can stand in one place and swing the load from face to truck making 3 or 4 passes a minute. The scoop shovel can operate in headrooms as low as 10 ft. 6 in. and can pass through entries a foot lower, making it useful in underground operations.

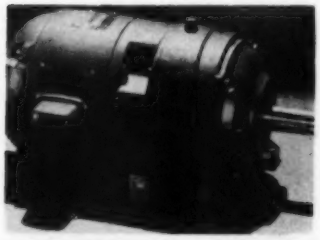
The dipper has a capacity of 1¼ cu. yds. and will operate down grade, horizontally, or upgrade. It will handle any material that can be loaded by a pushing or lifting motion or a combination of the two.

● Self-Powered Wagon Drill

A self-powered, self-propelled wagon drill has been announced by Schramm, Inc., West Chester, Pa., under the name of "Deluxe Pneumafeed."

The new model combines the features of a tractor, a portable compressor, and a wagon drill. The drill can be used in a 180 degree arc at any angle and up to 6 feet to the rear of the tractor by means of an extension arm. It can drill horizontal holes as high as 10 ft. above ground level or 3 ft. below. For transit the drilling mechanism fits in front of the rear wheel and close to the body.

The machine can be fitted with a breaker instead of a drill for use in breaking, cutting, and driving operations. It is adaptable to operations where portability and mobility are important.



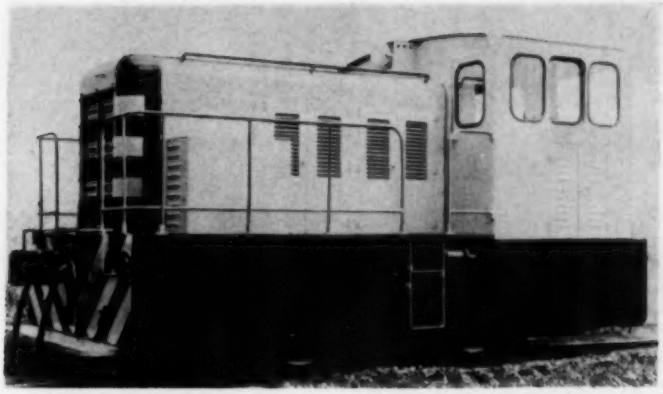
● Three-Piece Gear Motor

A gear motor designed to simplify maintenance in case of a failure of the stator has been developed by the Small and Medium Motor Department, General Electric Company, Schenectady 5, N. Y.

The motor is built in three pieces so that the stator can be removed without disturbing the gear train. It includes a motor; a planetary gear; and an adapter. The adapter acts as the pulley end-shield for the motor, the motor end-shield for the gear housing; and a spacer for access to the stator frame bolts.

Changing the stator requires only the removal of the bearing enclosure screws, the bolts that hold the front end-shield, and the bolts that hold the motor to the adapter. A defective stator can be replaced by another round frame stator or by a standard stator mounted upside down.

The new motor is available in 1 to 75 hp. for standard applications and up to 200 hp. for special uses. Speed ratings are from 780 to 13.5 r.p.m.



● Industrial Locomotive

A diesel-hydraulic locomotive for switching and similar industrial uses is being built by Baldwin-Lima-Hamilton Corporation, Eddystone, Pa.

The new locomotive, the "Model SH 2190", is powered by a 6-cylinder, 4-cycle, supercharged diesel engine rated at 225 hp. The locomotive has a starting tractive effort of 17,500 lb. at 25 percent adhesion, and 21,000 lb. at 30 percent. It is built for track gages from 30 to 66 in.

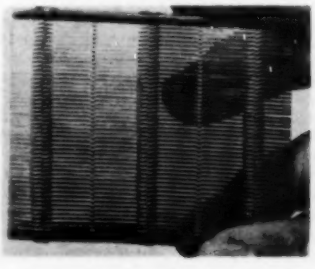
Power transmission includes a Twin-Disc torque converter and a clutch with two-speed transmission and an axle hung reverse gear. Speeds are 10.6 and 28 m.p.h. The wheels are driven by heavy-duty roller chain connecting the axles, and are mounted in roller bearing journals. The air brake system is Westinghouse straight air type with a self-lapping brake valve. Braking is supplied only for the locomotive but is available for the train line as an extra item.

● Dewatering Screen

A "Wedge-Slot" screen for dewatering of fine materials has been brought out by the Hendrick Manufacturing Company, Carbondale, Pa.

The new screen consists of stainless steel bars having a wedge-shaped cross section which are mounted with the flat sides up to prevent blinding. The screens are available in two types, "10A" for openings from 0.004 in. to 0.04 in.; "15A" for openings from 0.012 in. to 0.06 in. Slot spacings are said to be uniform even with the smallest sizes, and are prevented from distorting by spacing rivets every inch and by the use of special spacing lugs between the profile bars which lock the mesh.

Both type screens can be provided with tension clamps for side or end tension or for use with any make of vibrator. They may be installed without tensioning on shakers, vibrators and stationary equipment by bolting or clamping. The small spacing of the mesh is claimed to make salvaging of fines materials possible.



● Automatic Boiler

A horizontal fire-tube boiler is the main component in the "Powermaster" automatic steam generator made by Orr & Sembower, Morgantown Road, Reading, Pa.

The burners for light or heavy oil and gas fuels are said to operate with high efficiency between 30 and 100 percent of full load rating. Combustion gases travel through a central tube and then reverse the flow through a bank of fire tubes, and then again flow through two banks of lateral fire tubes to the flue. An integrated control system and interlocking safety devices are part of the unit.

These boilers are built in 16 sizes from 15 hp. to 500 hp. and for pressures to 250 psi.

● Split Dust Collector

A method of splitting the filtering and recovery of dusts in their dust collectors has been developed by the Day Company, 812-3rd avenue, N.E., Minneapolis 13, Minn.

The collector is fitted with plenum splitters which take the dust-laden air from two or more exhaust fans and feed it into the felt tube filters. Each set of tubes is fed separately and discharges into separate hoppers so that recovery of dusts from several sources may be handled without contamination and simultaneously.

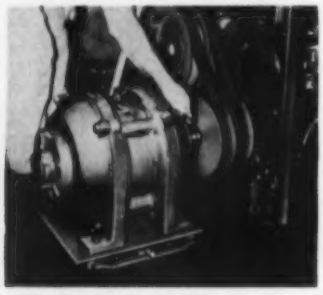
The collector utilizes traveling reverse-jet air rings which dislodge collected dust on the filter and force it into the air stream leading to the bottom of the unit.

● High Flotation Tire

An off-the-road tire that provides positive traction in sand or loam has been announced by the B. F. Goodrich Company, Akron, Ohio.

The new tire is rounded to provide better flotation, and operates on pressures of 20 to 25 lb. in sand. The cord body is of Nylon to resist flexing strains, and the face has shallow tread design that provides traction without a tendency to dig in. A tapered bead seat prevents rim slippage at low pressures. It is a 65 in., 18-ply Earth-Mover.

The tire was developed in cooperation with the R. G. LeTourneau Company who tested it during the development stage.



● Variable Speed Drive

A variable speed drive that incorporates the Taper-Lock principle has been developed by Dodge Manufacturing Company, Mishawaka, Ind.

The drive consists of four components: a variable pitch motor sheave, a set of wide range belts; a companion sheave; and a slide motor base. The Taper-Lock principle is used in both sheaves in the drive and contributes to the rapidity with which speed changes may be made.

The sheaves are locked on the shafts by turning a screw to tighten the tapered bushing. The pitch diameter is also adjusted by a set screw. Belts are of the "R" section and are oil-proof, heat-resisting, and static-conducting. The slide motor base permits adjusting of the belt tension to compensate for changes in the sheave diameters. One screw provides for the full range of adjustment.

The entire assembly is engineered to provide a maximum of variable adjustment with simplicity of construction and operation.

● Welding Helmet

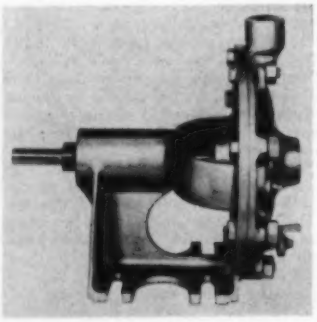
A seamless all-plastic welding helmet has been brought out by the Boyer-Campbell Company, 6540 St. Antoine Street, Detroit 2, Mich.

The helmet is composed of a thermo-setting Fiberglass, reinforced polyester resin that is strong and moisture resistant. It is lighter than vulcanized fiber and may be easily cleaned and sterilized.

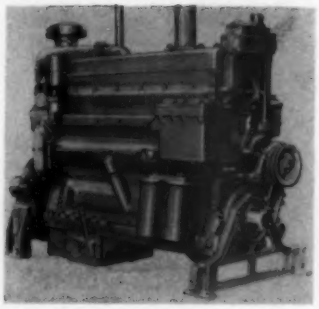
Other features of the new helmet are plastic headgear; free-floating suspension; and ratchet type size adjustment.

● Reversible Pump

A pump designed especially for circulating cooling water in engines, air compressors, and other machines has been developed by the Gardner-Denver Company, Quincy, Ill.



This pump, the model "CAY," is completely reversible. It will rotate in either direction with equal efficiency, and may be used with any type of drive. It delivers up to 67 g.p.m. and will operate with heads to 50 ft. Prelubricated ball bearings and a mechanical seal that eliminates stuffing box leakage are additional features of the pump. The simplified design is said to make installation and piping connections much easier as there are no rotation problems to overcome.



● Diesel Power Unit

A high-speed diesel engine is in production by the Caterpillar Tractor Company, Peoria 8, Ill. The engine is six-cylinder with 5¼-in. bore and 6-in. stroke.

Designated as the Cat D326 it is available as an industrial engine with an intermittent output rating of 170 hp.; as an electric set with a rated output of 80 kw., 50-cycle current; and as a marine engine with a continuous duty rating of 118 hp.

Features of the new engine include individual fuel injection pumps for each cylinder with short, indentical fuel lines; single camshaft operation of cylinder valves and fuel pumps; heat resisting inserts in the top of cylinders and valve seats; steel-backed aluminum main and connecting rod bearings; and oil-jet piston cooling.

● Humidifying Unit

A humidifying unit for use in maintaining proper storage conditions for paper bags, or in other places where proper humidification is desirable has been brought out by the Bahnson Company, 1047 S. Marshall street, Winston-Salem, N. C.

The units are self-contained and are suspended from the ceiling. Water supply and electric lines are connected and they are ready for operation. Water is atomized by centrifugal force and distributed horizontally through a 360 deg. opening, which can be blocked off for directional distribution.

Each unit evaporates about 3 g.p.h. and may be installed singly or groups with automatic control. Each unit will humidify several thousand cubic feet of volume under normal conditions.

Sand and Gravel Contest

(*From page 71*)

Products, Inc., Barneveld, N. Y., 17,568 man-hours

East Peoria dry pit, Peoria Concrete Construction Co., East Peoria, Ill., 17,525 man-hours

West Alexandria dredge, Steiners Sand & Gravel Co., West Alexandria, Ohio, 16,964 man-hours

Lapis-Prattco No. 110 & 109 dredge, Pacific Coast Aggregates, Inc., Marina, Calif., 16,802 man-hours

Lewiston dry bank, Maine Sand & Gravel Inc., Lewiston, Maine, 16,574 man-hours

Sand Springs dredge, Arkansas River Sand Co., Sand Springs, Okla., 16,265 man-hours

North Wilbraham dry bank, Construction Service Inc., North Wilbraham, Mass., 16,240 man-hours

No. 20 dredge, Lyman-Richey Sand & Gravel Corp., Central City, Nebr., 16,236 man-hours

"C" dry bank, Hornell Gravel Corp., Cohocton, N. Y., 15,365 man-hours

Hewitt No. 3 dry pit, Consolidated Rock Products Co., North Hollywood, Calif., 15,148 man-hours

Ricks wet pit, Texas Construction Material Co., Alleyton, Tex., 15,000 man-hours

Brilliant wet pit, The Brilliant Sand Co., Brilliant, Ohio, 14,443 man-hours

Butlerville dry pit, Utah Sand & Gravel Products Corp., Salt Lake City, Utah, 13,294 man-hours

Milford dry bank, Rosenfeld Washed Sand & Stone Co., Milford, Mass., 13,016 man-hours

Camden wet pit, White Gravel Co., Camden, Ohio, 11,125 man-hours

West Peoria dry-bank pit, C. L. Swords & Son, Peoria, Ill., 10,279 man-hours

St. Charles dredge, St. Charles Sand Co., St. Charles, Mo., 10,008 man-hours

Newburgh dry bank, The Windsor Building Supplies Co., Inc., Newburgh, N. Y., 9,360 man-hours

Follansbee dry bank, The Brilliant Sand Co., Follansbee, W. Va., 9,326 man-hours

Lewiston dry pit, Lewiston Crushed Stone Co., Inc., Lisbon, Maine, 9,153 man-hours

Fort Gay dredge, Laval Sand Co., Fort Gay, W. Va., 8,372 man-hours

Cleveland dry bank, The Kaiser-Nelson Co., Cleveland, Ohio, 8,290 man-hours

Los Gatos dry pit, Los Gatos Sand & Gravel Co., Los Gatos, Calif., 7,934 man-hours

Beason dry pit, McGrath Sand & Gravel Co., Beason, Ill., 2,841 man-hours

"I" dredge, Hornell Gravel Corp., Irving, N. Y., 2,146 man-hours

The 166 plants enrolled in the 1951 contest operated 10,827,501 man-hours and had 277 disabling injuries. The frequency rate was 25.583 per 1,000,000 man-hours and the severity rate was 2.341 per 1,000 man-hours of work. This frequency rate was less favorable than in 1950 and was also higher than the corresponding rates at quarries and open pits entered in the 1951 National Safety Competition of the Bureau of Mines. The injury frequency rate at 202 stone quarries was 14,381 and at 88 open-pit operations it was 11.800. The severity rate of 2.341 at sand-and-gravel plants was far more favorable than the rate of 4.694 experienced at stone quarries, but was 20 percent higher than the 1.944 rate at open-pit operations in the National Safety Competition.

At the 166 sand-and-gravel plants there were one fatality, and 9 permanent partial and 267 temporary total injuries. The total time loss from all injuries at the competing plants was 25,352 days. The average severity of all injuries was 92 days and of the temporary total disabilities 24 days for each injury.

At the enrolled dredge plants in 1951, the injury rates were 19.268 per 1,000,000 man-hours and 1.192 days of disability per 1,000 man-hours. These rates were lower than the corresponding rates at bank or pit plants, where the respective rates were 29.202 injuries per 1,000,000 man-hours and 3.000 days lost per 1,000 man-hours. The 1951 frequency rate at dredge operations was almost 13 percent lower and at bank or pit operations 13 percent higher than the corresponding rates in the 1950 competition.

A total of 148 identical plants have enrolled in the competition in the two years it has been conducted and sponsored by the Bureau of Mines. In the 1951 competition, 44 plants, entered in the 1951 contest, did not re-enroll. However, this loss in the number of competing units was partly offset by 18 new participants.

The leading classifications of accidents resulting in injuries in 1951 were falls of persons, machinery, handling objects, haulage, and falling objects. Accidents under these five classifications totaled 203 or 74 percent of all accidents at the participating plants.

At bank or pits accidents from handling objects predominated, followed in order of occurrence by falls of persons, haulage, machinery, and falling objects. Together the accidents under these classifications caused 146 disabilities or slightly over 74 percent of all injuries at bank or pits. At dredging operations falls of persons, machinery accidents, flying objects, haulage accidents, and accidents from handling objects were responsible for 57 or 75 percent of all disabling injuries.

The most severe injuries at all plants resulted from machinery accidents, slides of material, haulage accidents, and falls of persons. Over 87 percent of the total lost-time was charged against these four classifications. The one fatality in 1951 was the result of a slide of material in a pit.

Labor Developments

(*From page 105*)

stituting the benefit; *and*

(2) If the proposed benefit is a reimbursement for a job-connected expense, describe the connection and show how the expense and reimbursement are related; *and*

(3) State, if possible, the estimated cost of the proposed benefit.

How to Secure Information on Area and Industry Practice

Publications of the following are commonly used as sources for the required data: Bureau of Labor Statistics, university research departments, international unions, trade associations, chambers of commerce. Unpublished data may be obtained from local employers and local unions.

Please identify the source you use.

By Leo T. Parker
Attorney at Law
Cincinnati, Ohio

How to Win Law Suits

Last month I answered several interesting and informative legal questions asked by readers with whom I talked while making a trip through western and northwestern states. My purpose in talking with these persons was to obtain first hand information of their important legal problems. In this article I shall endeavor to answer, for the benefit of all readers, other presented legal questions which appeared to be foremost in the minds of the average producer of nonmetallic products.

Bonus Contracts

One interesting question, perhaps primarily due to the present high cost of wages, involved the validity of bonus agreements made with employees. The question is: "Is an agreement by an employer to pay an employee a bonus at the end of a year valid and enforceable?" According to a late higher court decision, the answer is yes.

For example, in *Specker v. Sun Company*, 60 Alt. (2d) 400, the testimony showed facts, as follows: One Specker was employed by a corporation under a financial arrangement by which he received a definite salary, plus a bonus at the end of each year. One year his bonus amounted to $900. The following year the control of the corporation passed

into new hands. At a meeting of the employees a new executive of the corporation orally informed them that their continued services were desired and that their salary and bonus plans would be as good as, and, if possible, better than in the past.

Specker remained in the corporation's employ until the end of the following year, when he voluntarily resigned. The corporation refused to pay any bonus, and Specker sued to recover the promised bonus.

In holding the corporation liable for payment of $900 bonus to Specker, the higher court said:

"The oral promise that bonus payments would be as good as those of previous year definitely fixed a minimum amount. The jury's verdict establishes that appellent's (corporation's) engagement was to pay the appellee (Specker) a bonus of at least $900."

Hence it is well established that under ordinary circumstances, although an employee resigns or is discharged before the termination of a bonus period, his employer must pay the definitely promised bonus.

On the other hand, no employee is entitled to receive an "indefinite" bonus. See *Butler v. Kemerer Company*, 67A. 332. Here the testimony showed that an employer verbally promised that his profits would be divided with his employees on a "very liberal basis". The higher court held that the employee could not recover any bonus, saying:

"There was no standard by which they (the jury) could measure the degree of liberality with which the defendant (employer) should reward the plaintiff (employees).

Court Construed Contract

Another reader asked the question: "If a seller makes a contract to furnish certain material to a contractor for a specified job, can the contractor compel the seller to furnish materials for other jobs, connecting the job specified in the contract? How will a court interpret such a contract?"

In almost every litigation involving a sale contract, the court is required to interpret the legal meaning of certain clauses in the contract. One of the litigants usually contends that the contract has a certain meaning, whereas the other litigant argues to the contrary. Usually the courts will interpret a contract in *strict* accordance with the dictionary meaning of the words expressing the obligations of the contracting parties.

For example, in *Tampa Engineering Co. v. General Construction Company*, 43 F (2d) 309, it was disclosed that a contractor wrote to a seller a letter, as follows:

"This will be your order for base rock for 22nd Street Causeway, the price for same to be $2.00 per cubic yard as measured in our trucks. We to load same. . . . Terms 30 days. Date wanted: as desired."

The seller acknowledged this order, but failed to deliver the rock. The contractor filed suit, contending that he was entitled to recover as damages from the seller $29,754, which was the difference between the contract price and the price he was compelled to pay for rock to complete the 22nd Street Causeway, and other streets mentioned in the contract which he had made with the city. The contractor argued that the term "Causeway" included all of the street construction he had under contract.

The lower court rendered a verdict in favor of the contractor, but the higher court reversed this decision, saying:

"The contract made by the order of November 2d and its acceptance by the letter of November 9th is clear and unambiguous. It sells sufficient rock for the '22nd Street Causeway' at the price and on the terms stated in the order. Under this contract appellant (seller) was bound to deliver and appellee (buyer) to buy what was required for that causeway, whether appellant (seller) had it on hand or not. Under the contract to sell rock for the causeway, the amount on hand would be immaterial, and the amount necessary for the causeway would control. . . . Nevertheless the contract proven is *only* for rock for '22nd Street Causeway'. That expression alone is used in all the correspondence."

High Damage Allowance

A reader asked this question: "What rule can officials of sand and gravel and other nonmetallic companies use to decide whether to compromise damage suits filed by injured persons and employees? We have a case now where a pedestrian was injured by our motor truck and he is suing our company for $200,000 damages. Is it possible that he could collect this excessive amount of damages?" The answer is: It is possible.

For illustration, in *Enyart v. Santa Company*, 241 S.W. (2d) 268, it was shown that a metal advertising sign owned by the Santa Company fell on a pedestrian as she walked along the sidewalk. The sign struck her head and injured her. While she now lies down some part of each day, yet she now walks about her home and the streets. Although the pedestrian is 72 years old, the higher court awarded her $15,000 damages, saying:

"Plaintiff was 72 years of age when injured. Prior to her injuries, she was an active, cheerful woman, doing all of her housework and the gardening. The rule of reasonable uniformity of verdicts is a sound and desirable one."

For comparison, see *Summa v. Morgan Company*, 165 S.W. (2d) 390. Here the injured person was 72 years of age, with an expectancy of seven to eight years. The higher court allowed her $17,500 damages for an ordinary injury.

Of course, in both these cases the injured persons were relatively aged. Hence the higher court awarded what it considered as being "nominal" damages. The life expectancy of the injured person is a very important factor when determining the amount of damages allowable by a higher court. And although each of the above mentioned injured persons were 72 years of age, the damage allowances were relatively high. If the injured person is young, and his life expectancy is many years, the damage allowances increase accordingly.

For example, in *Trowbridge v. Abrasive Company*, 190 Fed. (2d) 825, one Trowbridge, 44 years of age, was seriously injured when a grinding wheel flew apart. Trowbridge sued for damages. The testimony showed that Trowbridge was permanently disabled and was hospitalized for 15 months, suffering extreme pain. The jury originally awarded $150,000, but finally "reduced" the damage allowance to $126,182. This higher court approved the verdict, saying:

"We need not decide whether the verdict is excessive, for this court will not substitute its judgment for that of the jury or the trial court. A careful study of the evidence of damages in the record has failed to convince us that this verdict was so grossly excessive as to justify reversal on this ground."

Therefore, it is quite apparent that higher courts generally approve a jury's verdict, unless the verdict is "grossly" excessive.

Contractor Recovers Extra Payment

A reader asked this question: "If an official of a city unintentionally misrepresents work to be done by a contractor, can the contractor sue and receive extra payment above the contract price?"

The answer is as follows: A recent higher court held that if the agent of a property owner or corporation, misrepresents facts to a contractor, the latter may sue and recover additional payment for the extra work he is compelled to perform resulting from these misrepresentations. This same law is applicable to municipalities.

For illustration, in *Sylvester v. Town of Ville Platte*, 49 So. (2d) 746, the testimony showed facts as follows: A city called a special meeting of the board of aldermen. At this meeting it was decided to move or relocate a gas pipe line. The city advertised for bids for the performance of this work. A contractor named Sylvester submitted the low bid of $6,900 for the entire work, which was accepted by the board of aldermen.

Prior to the preparation and submission of his bid, Sylvester visited the mayor and town clerk for the purpose of examining the specifications for the work and was informed that none had been prepared. However, he was told at the city hall that one Fontenot was in charge of the gas system operated by the town, and could supply all necessary information. Sylvester and his foreman contacted Fontenot who told them that there were 12 or 13 gas connections, and not over 14 to be moved. Later Sylvester discovered, when doing the work, that there were many more connections to be moved than 14, as estimated by Fontenot.

In subsequent litigation the higher court held that Sylvester had entered into the contract with the city based on erroneous representation by Fontenot as to the number of gas connections required to be removed and, therefore, Sylvester was entitled to annulment of the original contract and could recover

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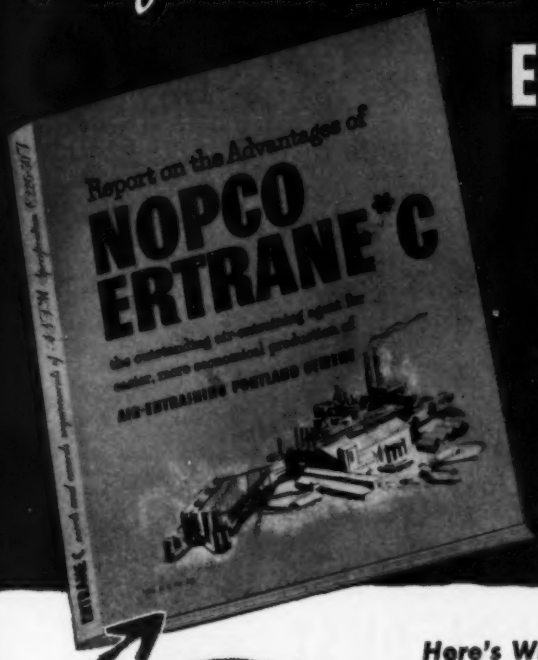

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payment for the full value of his work performed. The court said:

"Accordingly, it seems manifest that, since the town's representatives misled plaintiff with respect to a very material fact, he would be entitled to have the agreement set aside."

Must Rescind Promptly

A reader asked this question: "I purchased a rock crusher in May and it did not operate as guaranteed by the seller. I continued to try to use the crusher until October, but it would not do my work. The seller refused to take back the crusher and is suing me for the full contract price. Can I compel the seller to take back the crusher, since he did not fulfill his guarantee?" According to a late higher court decision the answer is no.

Modern higher courts consistently hold that a purchaser is bound to *promptly* cancel a contract of sale and return the equipment to the seller if the rescission is based on the grounds that the equipment does not equal the guarantee given by the seller.

For instance, in *Abram v. Arrighini*, 232 N.W. 196, it was shown that in February a person named Artil purchased a concrete mixer on credit. Upon trial the mixer did not operate to Artil's satisfaction, and he complained to the seller. Although Artil complained that the mixer was not satisfactory, he did not offer to return the mixer to the seller until September. The seller filed suit to recover the balance due. Artil contended that he was not to pay for the mixer, because it failed to equal the guarantee given by the seller. However since Artil did not promptly rescind the contract and offer to return the mixer to the seller, the court held the seller entitled to recover the balance due.

Not Governmental

"If a city makes a contract with the owner of a gravel pit, rock quarry, or the like, to pay a specified amount for material and the city uses its own employees to remove the material from the pit, who is liable if an employee is injured?"

According to a late higher court decision, the answer is: The owner of the pit is not liable if he does not control the employees, and the city is not liable because it is performing governmental functions.

A city never is liable for injuries to persons or private property while performing governmental functions unless the testimony shows that (1) a state law positively makes the city liable; (2) or the city is operating a legal nuisance.

The leading higher court case involving this phase of the law is *Casey v. Bridgewater Twp.*, Somerset County, 151 Atl. 603. Here it was shown that municipal officials made a contract with the owner of a gravel pit. It was agreed that the city would hire men to dig and haul gravel from the pit for use in repairing its streets. An employee was seriously injured when the pit caved in. He sued for damages, alleging that the city was liable because in hauling the gravel, the city was engaged in a business for profit. However, the court held

the municipality not liable, stating the following important law:

"The municipality cannot be said to have been engaged in business for profit merely because it made an agreement incidental to the performance of its public duty to build and repair its roads, no matter how advantageous the contract may have been. It did not own the pit, neither did it maintain or operate it. It bought the gravel with the right to dig and remove it, in such quantities as was required for the work. It was therefore acting wholly within the scope of its functions, in the performance of a public duty."

This court explained that if the city had owned, maintained and operated the gravel pit for the purpose of selling gravel for a profit, it would have been liable, because then the city would not have been performing governmental functions.

Within Scope of Employment

A reader asked this question: "If a truck driver leaves the truck of his own accord to get a drink of water, sandwich, or the like and he sustains an injury, can he recover compensation under the State Workmen's Compensation Act for the injury?" According to a late higher court decision, the answer is yes.

For illustration, in *City Company v. Lockhart*, 229 Pac. (2d) 586, the testimony showed facts as follows: A driver named Lockhart parked his vehicle and walked across the street to secure a drink of water and a cup of coffee in a cafe. When returning to his vehicle, he slipped and fell after stepping on some ice. Lockhart broke his leg in the fall, and sued the employer for compensation under the Workmen's Compensation Act.

Notwithstanding the fact that Lockhart was injured while attending to his own personal desires and wants, the higher court awarded compensation. This court quoted:

"While the mere act of getting water is not a part of the duties of the employee, yet is a physical necessity which must be attended to while the employee is engaged in his duties, and he is entitled to the same protection in the interval when he leaves his work to get water as when he is actually at work, and whether the water is provided by the employer, or by himself. We are of the opinion and hold that under the facts and circumstances of this case, the obtaining of the water and coffee was an act incident to the performance of the duties of claimant (Lockhart) and that the accidental injury arose out of and in the course of his employment."

Also, see the following higher court cases: *Rainford v. Chicago Company*, 289 Ill. 427;; *Sztorc v. James H. Stanbury Company*, 179 N. Y. Supp. 586; *Martin v. Lovibond & Sons*, 6 B.R.C. 466, 83 L.J.K.B. N.S. 806; and *Nester v. H. Korn*, 198 N.W. 949. All these courts hold that where the employee leaves his vehicle or truck to procure food or refreshments, and is injured while on such mission, the injury is compensable, since the act in which he was engaged was reasonably incidental to the "performance of his work."

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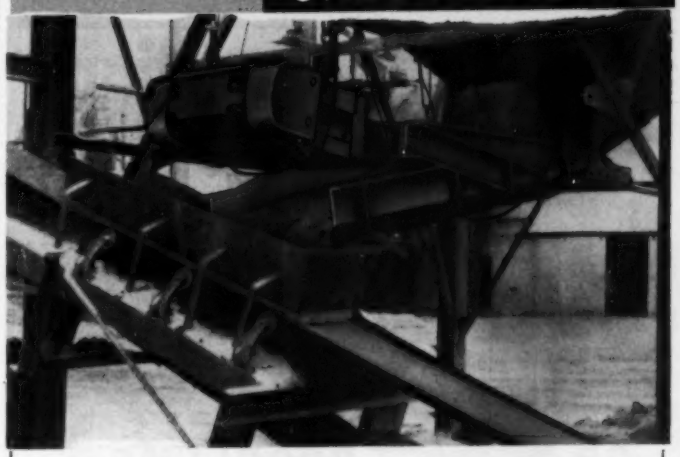

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personal mention

JOHN C. LAPP, manager of methods and systems for the National Gypsum Company, has been elected president of the Buffalo, N. Y., branch of the National Office Management Association.

HUGH S. LEWIS has been appointed executive vice-president of the Michigan Limestone Division of United States Steel Corporation. He has been vice-president in charge of operations since 1945.

A. W. Hicks

M. N. Quint

Marquette Cement Manufacturing Company recently announced the promotion of Alvin W. Hicks from sales manager in the company's St. Louis office to the newly created post of assistant director of sales for Marquette and its subsidiaries. He will be immediately transferred from St. Louis to Marquette's general offices in Chicago where he will be executive assistant to the company's vice president and director of sales, S. L. Cribari.

M. N. Quint, assistant to Hicks for the past five years in the St. Louis office, has been advanced to sales manager for the Missouri-Southern Illinois area served by that office.

Member of the American Society of Civil Engineers and the American Concrete Institute, Hicks is a concrete specialist of wide experience. He received engineering training at the University of Texas and subsquently was employed in the engineering divisions of the Missouri Pacific Railroad, Arkansas State Highway Department, and by the Corps of U. S. Engineers before joining the Marquette organization in 1944.

JOHN C. HAVARD, who was formerly chief engineer of mines for the United States Gypsum Company at Chicago, recently became assistant resident manager of the Potash Company of America at Carlsbad, N. M.

While he was affiliated with U. S. Gypsum, Mr. Havard was plant manager and superintendent of quarries at Southard, Okla., plant manager at Evans, Wash., mining engineer in charge of California and Nevada prospecting activities, and works manager at Heath, Mont., and Midland, Calif., before becoming chief engineer of mines in 1948. He is an active member of the American Institute of Mining and Metallurgical Engineers and the Society of Economic Geologists.

The appointment of D. S. DINSMOOR, vice-president in charge of research and development for the American Potash & Chemical Corporation, to the board of directors of the firm was announced recently by Peter Colefax, president. Mr. Dinsmoor, who joined the company in 1948, was formerly vice-president of the Monsanto Chemical Company.

The management of the General Crushed Stone Company, Easton, Pa., announces that W. H. LITTEER, traffic manager, has been appointed district representative in charge of sales of its Watertown, N. Y., office. Mr. Litteer will continue his duties as traffic manager from that office.

Lone Star Cement Corporation announces the appointment of CURTIS JERNIGAN as assistant manager, "Incor" and Technical Service, in the company's New York office, 100 Park Avenue.

Mr. Jernigan was formerly assistant director of research, Lone Star Research Laboratory, Hudson, N. Y. He joined Lone Star in 1935, after graduation from William and Mary, serving as assistant chemist in the plant laboratory at Norfolk. During World War II, Mr. Jernigan served in the South Pacific, New Guinea, and Philippine campaigns, where he commanded the U.S.S. *Bisbee*, a destroyer escort.

National Gypsum Company, Buffalo, N. Y., has announced that general sales manager JOHN W. BROWN will become the top sales executive reporting directly to the president. WADE W. HILDINGER was named assistant general sales manager. DEAN D. CRANDALL, vice-president in charge of general sales will devote his full time to export, industrial and contract sales.

RALPH S. WATERBURY, western traffic manager of the Lehigh Portland Cement Company, retired recently.

FRANK E. MCCASLIN, president of the Oregon Portland Cement Company, was one of seven prominent men recently appointed by the U. S. Chamber of Commerce to the Northwest Development Committee. The purpose of the group will be to discuss mutual business problems of the United States and Canada. Mr. McCaslin was named chairman of the committee's United States section.

GEORGE QUIST has recently been appointed assistant to Claude E. Harper, vice-president and general manager of the Kaiser Gypsum Company, California. Mr. Quist was formerly with Gypsum Carrier, Inc., a subsidiary of Kaiser Gypsum.

Appointment of DONALD R. GUTHRIE as executive engineer in charge of engineering research was announced by officials of the Minnesota Mining & Manufacturing Company.

Mr. Guthrie will organize an engineering research group consisting of three sections: chemical engineering, machine development, and instrument engineering. The purpose of the new group will be to provide specialized engineering assistance to engineers in the company's various product divisions.

Mr. Guthrie joined 3M as a research chemist in 1939 and was made a division engineer in 1944.

JOHN C. CARRINGTON was recently elected a vice-president of the Freeport Sulphur Company. Mr. Carrington has been associated with the firm since 1939, and has served for the last five years as assistant to the president.

ALFRED M. ESBERG, vice-president of American Potash and Chemical Corp. in charge of its Eston chemicals division, has been elected a director.

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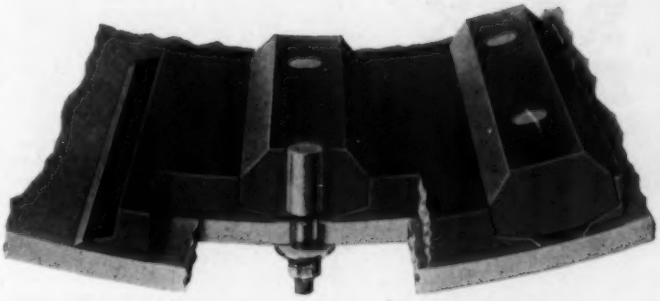

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Save valuable grinding space. Because of the strength and resistance to breakage of the rolled steel from which U·S·S Lorain Rolled Plate Linings are made, plates of reduced thickness can be used, thereby increasing the usable diameter of the mill . . . boosting output.

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There are U·S·S Lorain Rolled Plate Linings to fit any type of mill—for wet grinding or dry. Available through leading mill manufacturers whose names will be furnished upon request.

For uniform, efficient grinding action specify U·S·S GRINDING BALLS, too

● For still lower grinding costs and higher grinding efficiency, specify U·S·S Grinding Balls for your mill. They're made to exacting specifications . . . are carefully tested from raw materials to finished product to assure surface hardness and maximum hardness penetration. Available in diameters from $\frac{3}{4}$" to 5". For further information send for our free booklet on U·S·S Grinding Balls.

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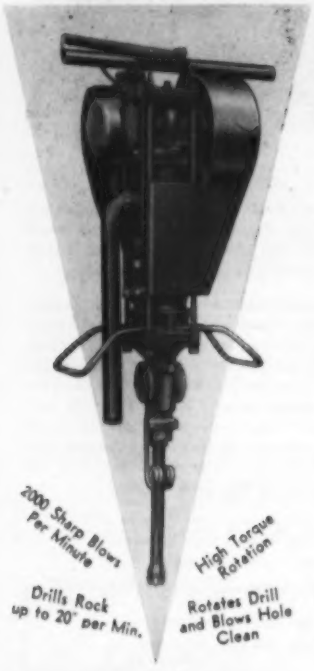

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Appointment of HERVEY S. MOORE JR. as full-time attorney and JOSEPH N. MCGOWAN as sales engineer was announced recently by Linus R. Gilbert, president of the Kingston Trap Rock Company, Kingston, N. J.

Mr. Moore, a prominent Trenton, N. J., attorney, joins the staff of the Kingston Trap Rock Company at the Kingston offices of the firm.

Mr. McGowan has been assigned as sales engineer for the Pennington Quarry Company, the firm's new central-mix concrete plant at Pennington, N. J. He recently completed an accelerated course in quarry techniques and blending and testing asphalt mixes, conducted by the highway departments of New Jersey and Pennsylvania, and also a course in the design and control of concrete mixes.

It was indicated that both appointments result from expansion of facilities by the firm, which annually quarries 1,800,000 tons of trap rock from 755 acres of quarries at Kingston, Pennington, and Lambertville, N. J.

JOHN P. BURROWS was recently promoted to post of general purchasing agent for the International Minerals and Chemical Corporation. Mr. Burrows joined the firm in 1933 and served for some years at the Mulberry operation. For the last eight years he has been assistant general purchasing agent; he now replaces the late J. M. Coppinger as purchasing agent for the entire corporation.

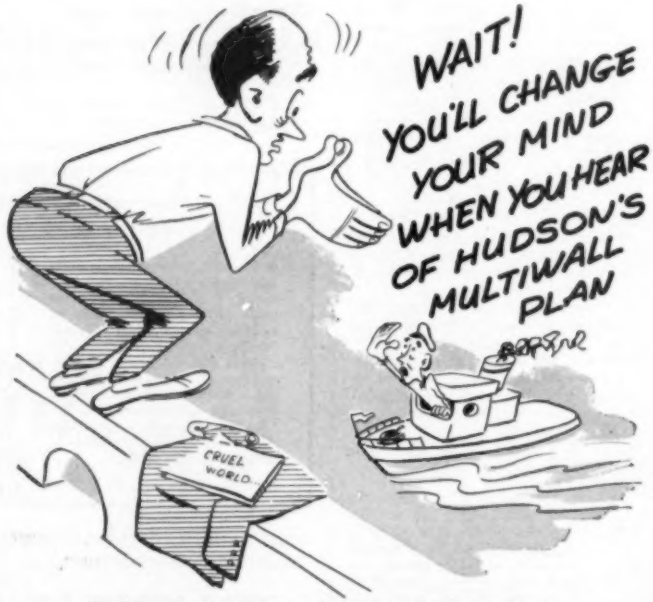
O. W. Traylor

OSBORNE W. TRAYLOR of Jackson, Miss., has been appointed service engineer for the Mississippi-Arkansas - Louisiana area served by the Jackson sales office of the Marquette Cement Manufacturing Company. His appointment to the Marquette staff was announced by Henry W. Graupner, sales manager for the area.

Mr. Traylor has been associated with the Mississippi Testing Laboratories for the last ten years and is a specialist in the uses of cement and concrete.

Election of WASHINGTON DODGE as a director of the Colonial Sand and Stone Company, Inc., New York, N. Y., was recently announced by Anthony Pope, president. Mr. Dodge, a writer of articles on economics, is also a partner in a New York stock exchange firm and a director of other companies in New York.

F. P. DIENER, chemical engineer of the Universal Atlas Cement Company, has been appointed director of tests and research. He succeeds the late George L. Lindsay.



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Appointment of RUSSEL T. DRENNAN and JOSEPH A. VOSS JR. as sales managers in eastern districts of the Chemical Division of Kaiser Aluminum & Chemical Sales, Inc., has been announced by F. M. Cashin, general sales manager.

Mr. Drennan will have supervision over sales and development of the division's complete line of basic refractory brick, mixes, and mortars along the Atlantic seaboard. He was with the Aluminum Company of America and at Kaiser Aluminum's Baton Rouge (La.) plant prior to joining the chemical sales organization.

Mr. Voss will be in charge of Midwest sales, including the steel centers of Pittsburgh, Cleveland, Detroit, and Chicago. He was formerly with Wisconsin Steel, Chicago, and Republic Steel, Cleveland.

Both managers will maintain headquarters at the division's general sales offices at Akron, Ohio.

A. M. INGEBRETSON has been elected president of the Columbia Gypsum Products, Spokane, Wash., succeeding Joseph Lux. Other officers named were JOHN C. TENOLD, vice-president, and BOYD MCDOWELL, secretary-treasurer. LORIN G. BROWN, ROSCOE W. LUCE, E. C. PHILLIPS, and E. L. WHITE were named directors.

MORRIS MARTIN was appointed general manager of the plant succeeding Mr. Tenhold who has resigned because of other interests.

HARRIS N. SNYDER, vice president, treasurer and general manager of the Buffalo Slag Co. Inc., and president and director of the Federal Portland Cement Co. and Federal Crushed Stone Corporation, Buffalo, N. Y., has been elected a director of the Manufacturers & Traders Trust Company of Buffalo.

The South Dakota State Cement Commission has announced the appointment of RALPH H. BASLER as chief engineer, and of DONALD R. MARQUARDT as superintendent in charge of production of the cement plant at Rapid City, S. D.

B. J. STEGER, controller for The France Stone Company, Toledo, Ohio, has been elected secretary of the Toledo Control of the Controllers Institute.

WILLIAM C. KNAPP, controller for The Arundel Corporation, Baltimore, Md., was named a director at the annual meeting of the organization's Baltimore Control.

CARL HOWARD has been named sales representative for the Basalite Division of Basalt Rock Company, Napa, Calif. He will handle the sale of building material in Napa and Solano counties, Calif.

WARREN O. CAMPBELL has been named to the quality control staff of the National Gypsum Company's plant at Parsons, Kans. Mr. Campbell was formerly the social welfare director of Montgomery County, Kans.

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STOCKTON "YUBABILT" CLAMSHELL BUCKETS

Stockton "Yubabilt" Power-Arm type clamshell bucket, 6 cu. yds., 22,000 lbs., welded steel plate construction, round nose without teeth, custom-built for Hawaiian Dredging Co.

2 TYPES—California and Power-Arm
CAPACITIES—½ to 6 cu. yd.
3 WEIGHT CLASSES—Heavy; Standard; Special Light Weight
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California Type designed expressly for channel and reclamation dredging, has few working parts, well balanced for digging peat soil, river bottom adobe and mud; discharges quickly and cleanly. First built in 1872, produced continuously ever since.

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Both the California and Power-Arm types are built in all three weight classes:

HEAVY for extra penetration in tough digging.

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Tough manganese steel is used to make parts that must really take rough use. When these parts wear beyond usability, they are often rebuilt with nickel manganese steel alloy. This has been a good practice to give worn parts a new service life equal to their original life.

It is a much better practice, however, to give worn manganese steel parts 2½ to 3 times their original service life by using nickel manganese plus hard-facing with Colmonoy No. 1 electrodes. While manganese steel has good impact resistance, it doesn't compare with Colmonoy No. 1 in resisting abrasion, and abrasion always accompanies impact.

With shock absorbing manganese steel as the "core" of the part, and abrasion resistant Colmonoy No. 1 as the protective "case" of the part, a maximum service life is assured users of manganese steel equipment.

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Colmonoy stands for a complete line of hard-facing alloys. Each alloy is resistant to a certain combination of abrasion, corrosion, impact, and heat. Colmonoy alloys come in various forms to suit different applications: oxy-acetylene rods, electrodes, paste, powder, wire, and castings.

Colmonoy Hard-Facing Manual

This new manual will make good hard-facing easier for you to do. It gives the characteristics of all Colmonoy alloys, typical jobs on which they are used (in every industry), full information on the Sprayweld Process, castings, finishing methods, etc. The manual was printed for you . . . write for yours today.

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Directors of the National Gypsum Company, recently elected DOUGLAS B. LITTLEWOOD as secretary and FRED A. WAGNER as auditor and assistant treasurer, respectively.

Mr. Littlewood succeeds WILLIAM M. NORTH, who has been named general manager of the government-owned ordnance plant at Parsons, Kans., now operated by National Gypsum. Mr. Littlewood has been assistant to the secretary since joining the company in 1948.

Mr. Wagner, who was former controller at the ordnance plant in Parsons, is succeeded by E. T. LEIFSON. Mr. Leifson had served as assistant controller since Jan. 1. MILO B. GILLESPIE is taking over the post of assistant controller.

LOUIS WARE, president of the International Minerals and Chemical Corporation, and MRS. Ware enjoyed a 'round-the-world tour last summer. Mr. Ware visited the major fertilizer plants in Japan, India, the Middle East, and Europe. The entire trip was made by air.

CLAUDE SIFFERLEN, formerly with U. S. Gypsum Company, was recently appointed sales representative of the Schuster Coal and Material Company, Indianapolis, Indiana. Mr. Sifferlen was also a former lecturer on building material usages at Purdue University.

GARNER A. BECKETT, president of the Riverside (Calif.) Cement Company, is chairman of the 1952 United Red Feather Campaigns in Los Angeles.

The Smoot Sand and Gravel Corporation, Washington, D. C., negotiated a new wage contract with its 160 employees belonging to the AFL operating engineers and teamsters unions. The agreement, which averted a threatened strike by the two locals, granted wage increases amounting to about $3 a week; in addition, the employees are to be given two $25 bonuses during the running of the 11 month contract.

New state rules and regulations governing blasting in New Jersey quarries, designed to afford greater safety to the public and operators, have recently been established according to Percy A. Miller, State Labor and Industry Commissioner. Mr. Miller said his department worked 18 months studying the blasting problem and drafting the regulations. Plans are being made to extend the regulations to construction blasting so far as the use of dynamite is concerned.

The Fredericktown Sand and Gravel Company, under different ownership, has started a new operation at the north edge of Fredericktown, Ohio. The new company, headed by Carl H. Stander of Mansfield, Ohio, purchased the former plant of Fredericktown Sand and Gravel, also located in north Fredericktown; however, the old plant is not now being used.

More Information, Please

CHECK AND MAIL THE CARD BELOW FOR ADDITIONAL INFORMATION ON NEW MACHINERY AND SUPPLIES

1. Reliance Road Building Maintenance and Quarry Equipment. Catalog No. 52. The twenty-eight pages of this catalog are illustrated with pictures of equipment designed for the production of crushed stone and sand for road construction and maintenance. Covered are such items as bins, portable and stationary; crushers; crushing plants; conveyors; elevators; feeders; fine crushers; screens; washing screens; and complete plant installations. Specifications are included for all the various items covered. Universal Road Machinery Company.

2. Owners Report. Farquhar Conveyors Save You Money. Literally a twenty-eight page picture book of conveyors in use. The material has been divided into package handling conveyors, bulk handling conveyors, special conveyors, and coal handling conveyors. The application and results of using conveyors are shown for a wide variety of industries. Loading and unloading of stock piles, bins, trucks, buildings, ships, construction projects and many other places are shown and briefly described. A. B. Farquhar Company.

3. Hardinge Mills. AH-440. The six pages of this folder present the types of grinding mills manufactured by the company. Included are conical mills, rod mills, cylindrical mills, tube mills, batch mills, "Tricone" mills, and "Thermomills". These types are illustrated by an installation photo and a cutaway drawing show construction, grinding media, etc. The brief text explains the major advantages of each type. A list of material handled by the mills is included and the uses by major industries is given. This is an introductory folder and more comprehensive bulletins are listed while some of the other products are shown and described briefly Hardinge Company.

4. Clevelands at Work. The pages of this bulletin show typical applications of worm gear speed reducer in driving equipment, and powering machinery. Two of the eight pages give information on the various types of units available in either small or large sizes. Sales offices are listed by cities. The Cleveland Worm & Gear Company.

5. White Industrial Engines. I.S.E.-101. This catalog insert present the important features of the 100 series IA industrial power unit. Features of the engines are pointed out by text while the standard and optional equipment is listed. Installation drawings showing dimensions are included and graphs showing performance of the six models take up another page. General specifications of the six models are given. The White Motor Company, Industrial Sales Division.

6. Crushers Must Be Tough. Rebuild, Repair with Manganal. This pocket size folder shows how to save time and money by rebuilding and repairing roll crushers, jaw crushers, and corrugated, smooth and concave gyratory crushers with Manganal welding materials and applicator bars. Elimination of build-up on hammermills hammers is also covered. Methods for obtaining the longest life from Manganal protected surfaces are presented. Stulz-Sickles Company.

7. Sly Dynaclone. Bulletin 102. An eight-page bulletin that gives complete engineering data on this dust collecting equipment, including details of construction, principle of operation, and application. Included are hints on the engineering of dust control problems as well as other useful information. Drawings and cutaway views show the points mentioned in the text and installation photos show some of the applications and models. W. W. Sly Manufacturing Company.

8. Separating Dry Commodities by Specific Gravity through Air Flotation. This folder illustrates and describes a line of machines that use air for float separation of dry products. Operation of the machines is described and models for several kinds of separation are shown. Dimensions, capacities, and construction details are given. Sutton, Steele & Steele.

9. Fuller Feeders and Rotary Valves for Dry Pulverized and Granular Materials. Bulletin F-4. Photos, drawings, specification tables, and general information about roll feeders, vane-type feeders, totally-enclosed feeders, and rotary valves are given in this eight-page bulletin. A list of material that are handled by rotary feeders, and a list of other equipment manufactured by the company are included. Fuller Company.

10. Gocorp Plain Pallet Block Machines. Gocorp "King". A four-page folder that tells the story of the block machines made by the company. Features of the machines are brought out and the advantages cited. Drawings and tables show dimensions of three models. Related and accessory equipment is shown and described. Gene Olsen Corp.

11. Euclid 15.5 Cu. Yd. Scraper Model TDT. Form No. 501. This eight-page catalog folder covers the 15.5 cu. yd. scraper. It describes and illustrates major design features and provides detailed specification data. A part of the folder covers the tractor while the balance is devoted to the features of the scraper. Photos are used to show the major features of both tractor and scraper. The Euclid Road Machinery Company.

12. 4 Stars of the Pyramid Line. Form PT. This pocket-size folder serves to briefly introduce four of the important steels produced by the company. They are Silvaloy rounds for close tolerance and high finish work; Mango-Plate for use in relining chutes, buckets, and other surfaces subjected to abrasion; Grouzabar shapes for repairing grousers on crawler equipment by simple welding; and Wear-Ex for maintenance repairing of surfaces that require toughness and abrasion resistance. Some of the other special steels are listed. Pyramid Steel Company.

13. Tournarocker. Form No. TR-137. The twenty-eight pages of this bulletin use action shots and cut-away views to show the integral parts of the machine. Among the points covered are tires, body, dumping mechanism, transmission and torque converter, differential, braking mechanism, controls, and attachments. The advantages of this machine as a rear-dump unit for heavy service are pointed out. R. G. LeTourneau.

14. Goodman Shaker Conveyors. Bulletin IMD-498. The four pages of this folder are filled with photos of installations showing the application of the metal trough shaker conveyors. Three models of drive units are shown and standard sec-

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tions and angle sections are illustrated. The text explains the action of the conveyor and lists the power available such as electric or air motors. Other features are brought out by illustrations and text. Goodman Manufacturing Company.

15. Mini-Mite Mounts on Any Truck of Suitable Capacity. Bulletin TX-127. This large folder presents the story of the Model 55 TC crane for truck mounting. The mechanical features of the model are shown by illustrations of the major components and the accompanying text points out the features. Photos show the use of the machine as a ½-yd. shovel, 7-ton crane, dragline, trench hoe, and clamshell. Harnischfeger Corporation.

16. Sheffield Moly-Cop Grinding Balls. This folder uses comparison microphotographs to show the reasons for the performance claimed for the grinding balls. In addition to describing the features of the balls the folder also gives complete specifications on the range of balls from ½ in. to 6 in. in diameter. Sheffield Steel Company.

17. Tracto-Lift Presents Power King. The eight pages of this bulletin are filled with action photos of the Power King lift truck in such heavy applications as handling concrete pipe, pallets of blocks, roof slabs, and in handling bulk materials such as sand and gravel, and crushed stone, by use of a scoop attachment. Complete specifications of six sizes are included. Tracto-Lift Company.

18. Hayproc Preservative Coatings, Formula No. 640. This four-page folder describes a clear liquid waterproofing compound for use on stone, cast stone, concrete block, brick or any other masonry surface. Action of the material, results to be expected, conditions for use, and other pertinent information is included. Part of the folder is used to describe other related products made by the company. H ynes Products Company.

19. Tufhorse Kant-Rip Hand Pads. Hand pads of leather for protection of workers handling abrasive materials such as concrete block are covered in the four pages of this folder. Two styles of pads and one of mitten are shown and briefly described. Prices are included. DesMoines Glove and Manufacturing Company.

20. Macwhyte Wire Rope. Catalog G-15. A pocket size ring-bound type book of 170 pages. The subject matter of the book is divided by tabular indexes into chapters or sections. Among the subjects covered are the various sizes of rope, aircraft cable, corrosion resisting, miscellaneous types, galvanized, strand galvanized, slings, fittings, lubrication, general information, and tables and glossary. An index adds to the usefulness of the book. Macwhyte Company.

21. Hauck Tunnel Burner Assemblies and "Sealed-In" Gas Burner Nozzles. Catalog No. 807. This folder gives capacities, dimensions, and general information about gas burner nozzles. Mixers for air and high or low pressure gas are shown. Types of mounting and use of refractory ramming mixes are covered. Hauck Manufacturing Company.

22. Industrial Tire Guidebook for users of Materials Handling Equipment. This 12-page booklet shows the complete line of Goodrich Industrial tires. The service in which each tire should be used and maintenance tips are also covered. B. F. Goodrich.

23. Link-Belt Cast-Tooth Sprocket Wheels. Book No. 2467. This eight-page booklet covers more than 200 sizes of cast-tooth sprocket wheels that are available from stock. The book also tells how to select stock sprocket wheels from stock to accurately fit the chain. The sprockets carried in stock will fit 78 types and sizes of chain employing sprocket wheels. Arm-center and plate-center types in cast iron or abrasion resisting material are covered. Link-Belt Company.

24. The Pneumafeed for Schramm Pneumatractor. Bulletin PPF-52. This single sheet bulletin illustrates and describes a drill for mounting on a tractor-air compressor unit. It is virtually a wagon drill mounted on the tractor-air compressor. Equipment, operation, uses, specifications, and extra equipment are some of the items covered. Schramm, Inc.

25. Industrial Wire Cloth and Screens. This four-page folder is almost entirely a pictoral catalog of screens. Comparisons of meshes and wire thicknesses are shown as well as various styles of screens. Hook strips are shown and special materials are covered in the text. The Ludlow-Saylor Wire Company.

26. Raymond Pulverizing, Separating, and Drying Units. Bulletin No. 65. The eight pages of this bulletin serve to introduce the various types of equipment manufactured by the company for the purposes listed in the title. Included are roller mills, bowl mills, Imp mills, automatic pulverizers, screen pulverizers, vertical mills, flash drying systems for use with several mills, whizzer type air separators and laboratory models. Raymond Pulverizer Division, Combustion-Engineering-Superheater, Inc.

27. Eriez non-electric permanent Magnetic Separators. Catalog 15-a. The sixteen pages of this bulletin cover many subjects in connection with metallic contamination of products. Covered are such subjects as essentials of magnets, types of magnets, magnetic humps for liquids or pressure, magnetic pipeline traps, magnetic drums and pulleys, metal detectors, installation, and permanency of magnets. Eriez Manufacturing Company.

28. Dodge Speed Reducers. Bulletin A-614-A. The twenty pages of this bulletin covers the line of shaft-mounted speed reducers sold as "Torque-Arm" speed reducers. The bulletin includes full engineering information and selection data on the line and also on the overload release. Cross-section views show the construction of the reducers, while photos show typical installations. Tables covering service factors, hp. ratings for single and double reduction types, dimensions, and V-belt drive recommendations are included. The back cover illustrates the line of pillow blocks, pulleys, bearings, drives, clutches, couplings, belts and take-ups that are other products of the company. Dodge Manufacturing Company.

29. Use and Care of Wire Rope. C-51. This pocket size booklet contains 72 pages of practical information on proper methods of handling, reeving, breaking-in, splicing, cutting, lubricating, and specifying wire rope. More than 50 illustrations and 32 diagrams and charts demonstrate and explain suggestions and recommendations for proper wire rope use and care. A. Leschen & Sons Rope Company.

30. How to Avoid Boiler Tube Corrosion. Article TR-514. Corrosion as a factor in shortening the life of boiler tubes is covered in this paper. It points out the various types and causes of corrosion, and gives a number of rules for obtaining maximum service life for boiler tubes. The article is illustrated. The Babcock and Wilcox Company.

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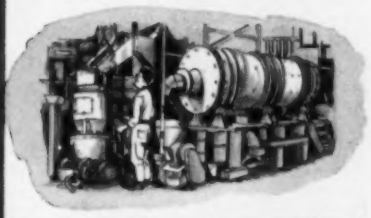
Laboratory Tests Help Quarry Operator Stop Dust Hazard

PROBLEM . . .

Dangerous silica dust was a health hazard to workers in a large eastern crushing plant. Minus 2-in. quartzite was being reduced by crushing and dry grinding to a size suitable for use in silica brick. The dust problem was acute.

WHAT WAS DONE . . .

The problem was brought to the Allis-Chalmers Research Laboratory. A series of batch tests — followed by continuous pilot mill tests — showed that the specified size analysis could be obtained by wet grinding. A flowsheet was worked out in which the quartzite was crushed in a *Hydrocone* crusher, followed by wet grinding the crushed product in rod and ball mills and blending the mill products in the correct proportions.



RESULT . . .

Guided by these laboratory tests, this quarry operator set up a wet process which eliminated a hazardous dusting condition and still obtained the specified product.

A-3834

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trade notes

The Three Point Belt Lacing Company, P. O. Box 389, Peace Dale, R. I., has acquired the rights and equipment of the belt lacing formerly made by the Bristol Company, Waterbury, Conn., and will manufacture the belt lacing under the new name. G. W. Little heads the organization.

The board of directors of LaPlant-Choate Manufacturing Co., Inc., Cedar Rapids, Iowa, has approved a plan of reorganization with Allis-Chalmers Manufacturing Company, Milwaukee, Wis.

Acquisition of La-Plant-Choate will broaden the industrial line of the Tractor Division of Allis-Chalmers in earthmoving and other fields.

It was announced that Allis-Chalmers contemplates the continued operation of the plant and facilities at Cedar Rapids, maintaining the present organization.

Lester J. Hyland, associated with the Thermoid Co., Trenton, N. J., for over 25 years, has been appointed sales manager of the industrial rubber division.

Succeeding Mr. Hyland as western division manager is Robert Gentles. Mr. Gentles has been associated with Thermoid since 1949 when he went to work as district sales representative.

R. B. Chessin has joined the Pyramid Steel Company, Cleveland, Ohio, as a sales executive. Mr. Chessin was formerly assistant sales manager for Allied Steel Products, Cleveland, Ohio.

J. A. McBride has been named general manager and vice-president in charge of sales of the Buell Engineering Company, Inc., New York, N. Y., the announcement was released by Buell's board of directors.

J. A. McBride

Mr. McBride had been sales manager for the company since 1938.

Conveyor belt production capacity at the Buffalo plant of Hewitt-Robins Incorporated will be increased 41 percent by a new million plant addition scheduled to go into production soon. The expansion will make the company one of the world's largest producers of conveyor belts, according to the report.

A 12,000 square foot building has been erected and machinery is being installed. The new equipment includes a modern press which will make belts up to 72 inches wide for long-haul conveyors used in the handling of coal, ore and other bulk materials. The widest belt that could be made on old equipment was 60 inches.

Dedication ceremonies are scheduled at the plant October 25. Employees and their families and friends will be invited.

The New York Belting and Packing Company has joined with the L. H. Gilmer Company. The new organization will continue to operate and be known as New York Belting & Packing Company.

The Gilmer products, including V-belts, flat belts, "timing" belts and shock pads, will retain the Gilmer name and will be sold by the new organization.

Fairbanks, Morse & Co., Chicago, Ill., recently announced that R. H. Morse III has been appointed general manager of the Beloit, Wis., works. This is the fourth generation of the Morse family to come to the management staff of the company.

Mr. Morse succeeds Orren S. Leslie as general manager of the company's largest manufacturing plant. Mr. Leslie has been named manager of manufacturing and has been transferred to the company's headquarters in Chicago.

• A. W. Bathke, safety director of the Chain Belt Company (right) watches as A. Wendle, superintendent of the erection plant (Plant No. 3), presents the National Safety Council award to H. L. Riley, a member of the plant's safety committee, representing 300 of his co-workers. These men had worked 1,297,204 man-hours from May 29, 1950, to December 31, 1951, without a disabling injury.

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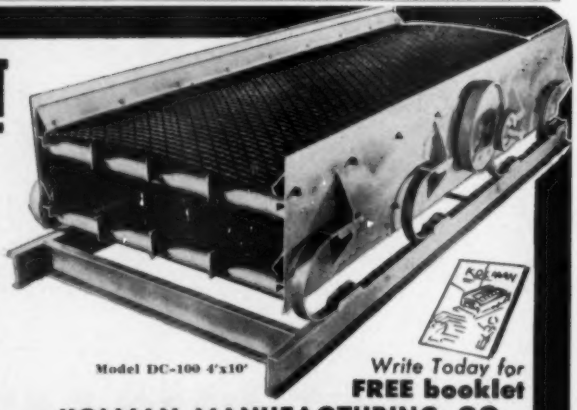
Action — vigorous action designed to give high capacity and more accurate sizing — action that prevents "blinding" or clogging — yet "floating" action that prevents transmission of damaging vibrations to attached equipment. That's what has made KOLMAN **the** screen in the construction business!

KOLMAN Series "C" screens (shown at right) are available in a wide range of sizes in single, double and triple deck models. Their compact, rugged construction results in a minimum of repairs and time loss. Before you buy any vibrating screen, investigate the advantages of a KOLMAN!



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Appointment of Delmar R. Lammers as service manager to assist in general service administration at Caterpillar Tractor Company, Peoria, Ill., has been announced. Succeeding him as eastern division service manager is Merle W. Dargel, and succeeding Mr. Dargel as service engineering manager is Theodore M. Fahnestock.

R. C. Brower, secretary-treasurer and director of The Timken Roller Bearing Company, died at his summer home at Melvin Village, New Hampshire, Sunday, July 13. He was sixty years of age. Mr. Brower first entered the bearing business in 1916 when he was hired as sales manager for the Bearing Service Company. He came with The Timken Roller Bearing Company January 1, 1923 as assistant general manager of the Service Sales Division. From that position he progressed to general manager of the Service Sales Division, assistant secretary and treasurer, and on April 4, 1930 he became secretary-treasurer of The Timken Roller Bearing Company. On January 11, 1936 Mr. Brower was elected to the Timken Company's board of directors. He remained in that position until his death.

Mr. Brower is survived by his wife, Mildred C., a daughter, Mrs. Ralph E. Walters of Neptune Beach, Florida, and a son, Robert C. Brower, Jr. A Mason for many years, Brower was a member of the Scottish Rite, Stark Consistory, the William McKinley Lodge, and York Rite of Canton, Ohio, and the Al Koran Shrine of Cleveland, Ohio. Funeral arrangements are under the direction of the Arnold Funeral Home of Canton, Ohio, where the funeral services will be held at 2:00 p.m. Wednesday.

The appointment of Edward Lebo as public relations director of Hewitt-Robins Incorporated was announced recently.

He was formerly assistant director of public relations of the United States Rubber Company and prior to that he worked on newspapers in Somerset, Pa. and in Poughkeepsie, N. Y.

His headquarters will be in the company's executive offices in Stamford.

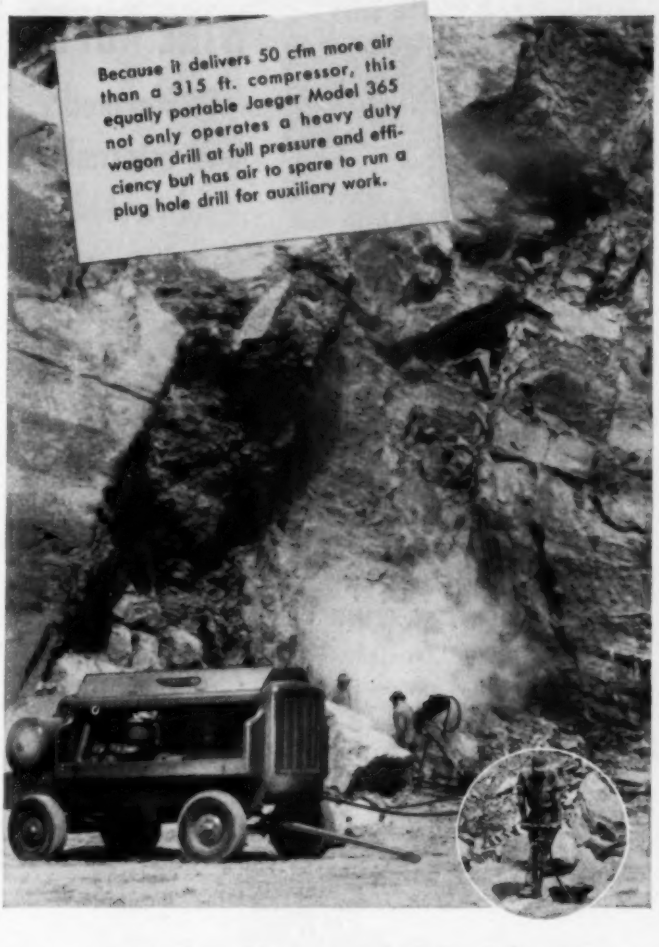
H. C. Davis, manager of the Bemis Bros. plant in St. Louis, Mo., has been elected president of the Industrial Bag and Cover Association. S. G. Yount, president of the Southland Paper and Converting Company, Los Angeles, Calif., was named vice-president of the association.

Chase Bag Co., Chicago, Ill., has announced that George K. Whyte is the new manager of the factory and sales office in St. Louis, Mo. Mr. Whyte formerly was sales manager in St. Louis.

Chase Bag Co., Chicago, Ill., has announced the promotion of R. F. Norcott to sales manager of the sales organization in Milwaukee, Wis. He was formerly a salesman in Buffalo and Chicago.

The board of directors of The Timken Roller Bearing Company has elected John A. Riley to the post of secretary and treasurer. He succeeds to the position vacated by the late R. C. Brower.

Jaeger "air plus" means 15% to 25% more air from portable compressors


Because it delivers 50 cfm more air than a 315 ft. compressor, this equally portable Jaeger Model 365 not only operates a heavy duty wagon drill at full pressure and efficiency but has air to spare to run a plug hole drill for auxiliary work.

As compact and portable as compressors of much less capacity, Jaeger Air Plus units produce, at the rock face, the air you need to operate your drills at full efficiency. Model 250 fully powers 2 heavy rock drills. Model 365 fully powers 3 heavy rock drills or one heavy wagon drill plus a plug hole drill. Model 600, introduced by Jaeger, was the first to run 2 heavy wagon drills efficiently. For increased production with low cost air power, see your Jaeger distributor or send for Catalog JC-1.

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3717 Fourteenth Ave., Kenosha, Wis. Manufacturers of Internally Lubricated PREformed Wire Rope, Braided Wire Rope Slings, Aircraft Cables and Assemblies, Monel Metal and Stainless Steel Wire Rope. Catalog available on request.

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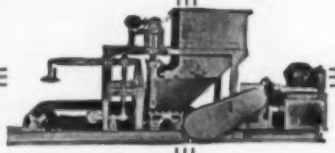

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Wide usage has proved that these fast, automatic, accurate machines insure higher capacity . . . better product uniformity . . . lower operating costs.

Poidometers are finely engineered and built to provide continuous service under all working conditions.

Available with remote controls for showing and changing feed rate, and with total weight recorders.

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J. L. Reid

J. L. Reid has been appointed district manager of Goodyear Tire & Rubber Company's mechanical goods sales at Salt Lake City, replacing W. T. Roberts, who retired after 32 years' service.

Mr. Reid has been in Salt Lake City as a field representative and was formerly a field representative at Phoenix, Ariz. In 1951 he was transferred to the Salt Lake City district.

William Luther Lewis, president of the Chicago Pneumatic Tool Company, 6 E. Forty-fourth Street, New York, died after an illness with which he was stricken at his home. He was 68 years old.

Officials of the Manitowoc Shipbuilding Company, Manitowoc, Wis., have announced that the three principal lines of its business will be manufactured by three separate corporations, instead of divisions of the parent company.

The manufacture of power shovels, cranes, draglines and other equipment will be carried on through the newly created Manitowoc Engineering Corp. of which J. D. West is president; C. C. Miller, vice-president in charge of sales; E. B. Nickles, vice-president in charge of engineering and F. W. Zimmer, sales manager. No changes in distribution are contemplated.

Shipbuilding activities and cement mills equipment will be confined to the newly created Manitowoc Shipbuilding, Inc., and the refrigeration activities will be handled through the Manitowoc Company, Inc.

The Syntron Chicago Sales Company announces the opening of a new store at 236 N. Crawford Ave., Chicago 24, Ill.

In addition to increased facilities for the engineering and sales staff, the new location affords room for carrying stocks of equipment and providing local service on SYNTRON Power Tools.

Union Industrial Corporation, Carlsbad, N. Mex., has signed a distributorship agreement with Worthington Corporation. The company will carry the line of Multi-V-Drives and Allspeed Selectors, serving Charles, Lea and Eddy Counties in New Mexico.

The Richardson Tractor Company, 601 50th St., Kanawha City, Charleston, W. Va., has been appointed distributor for Bucyrus-Erie ⅜ to 4 yard gasoline, diesel and single-motor electric, convertible excavators, Red Arch dragline buckets, the Hydrocrane, and the Hydrohoe according to a recent announcement.

The new distributor's territory includes the state of West Virginia, except the panhandle counties of Hancock, Brooke, Ohio and Marshall, plus the three most westerly counties of Maryland—Garrett, Allegany, and Washington.

Kenneth C. Korte

Kenneth C. Korte, formerly with Philip Morris, Montgomery Ward, and Executive Service, Inc., in sales, advertising, and personnel capacities, has been appointed advertising manager of the Baughman Manufacturing Company, Jerseyville, Ill.

Baughman, pioneer producer of spreader bodies, also manufactures a wide variety of self-unloading bulk material bodies and conveying equipment.

Mr. Korte attended Shurtleff College at Alton, Ill., and did graduate work at the University of Wisconsin before entering business.

A stock-carrying branch warehouse and sales office has been established by Quaker Rubber Corporation, Division of H. K. Porter Company, Inc., at 2201 N. Washington Ave., Minneapolis, Minn., to provide better service and deliveries to customers in the Twin Cities industrial area.

The new warehouse has 4,200 square feet of floor space designed to carry a complete inventory of industrial rubber products. It is under the overall supervision of T. H. Olson, midwest district manager, and will be managed by Alex Rogan.

The acquisition of the plant and remaining assets of Victor Electric Products, Inc., Cincinnati, Ohio, by Allis-Chalmers Manufacturing Company has been announced.

The plant will become a part of the Norwood Works and will house sales, engineering and manufacturing facilities of the Texrope Drive Section which have been carried on at the West Allis Works. A limited number of management personnel will be transferred to Norwood.

The Border Machinery Company, 1710 East Paisano Drive, El Paso, Texas, was recently appointed distributor for the Bucyrus-Erie line of 3/8 to 4 yard gasoline, diesel, and single motor electric convertible excavators, and the Hydrocrane, Hydrohoe and Red Arch dragline buckets.

The territory includes the seven southern-most counties of New Mexico—Grant, Hidalgo, Luna, Dona Ana, Otero, Eddy and Lea and the nine Texas counties west of the Pecos River—El Paso, Hudspeth, Culberson, Reeves, Pecos, Jeff Davis, Presidio, Brewster and Terrell.

Austin Goodyear has been elected a director of Hewitt-Robins Incorporated, Stamford, Conn. He is general manager of two divisions of the company—the Rubber Division, which manufactures conveyor belting and other industrial rubber products in Buffalo, and the Conveyors Division, which has plants in Passaic, N. J. and Philadelphia for the manufacture of machinery components for conveyor systems. He has been with the Hewitt-Robins organization since 1941.

RIP-RAPPING
with
32 Ton Stones

*Morrison-Knudsen Co.
Contractors—Boise, Idaho

An *exclusive* Owen Grapple feature contributed greatly to the speed, safety and success in placing thousands of tons of rip-rap to protect the down stream banks at Grand Coulee Dam.

The granite stones varied from 12 tons to 32 tons and no two were similar in shape.

Because of its Patented independent tine action the Owen Grapple alone could grasp such difficult objects with pressure exerted equally through all 4 tines regardless of the irreggular shapes of the stones.

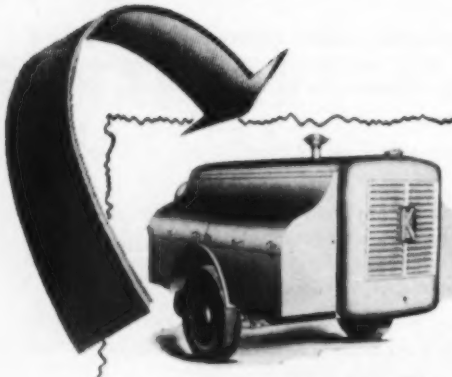
If you use grapples, investigate this exclusive Owen feature which speeds operations, increases safety and lowers per ton handling costs.

BUCKETS AND GRAPPLES

THE OWEN BUCKET CO.

You'll like this down-to-earth offer, too, from Hudson, the manufacturer of multiwall sacks who covers every step from tree to finished sack.

HUDSON PULP & PAPER CORPORATION
Dept. 101, 505 Park Avenue, New York 22, N. Y.



THE COMPRESSOR THAT OUTLASTED TWO OTHERS

Actual performance counts – and here is what a user says about the O.K. compressor after years of service.

"The compressor used by us has been more than satisfactory . . . it has worn out two newer models under much less difficult operation. We are using your compressor in connection with a large storage tank as much as 1-2 mile away and are never bothered with condensation or other usual air trouble." So says Mr. Walter Bauer of Memorial Park in Tulsa, Oklahoma.

OUR PRODUCTS HAVE BEEN GIVING SATISFACTION SINCE 1903

Available in single or two stage—gasoline or diesel—60, 85, 105, 160, or 210 cu. ft. actual free air. Mounting as desired.

Write for free bulletin or name of nearest dealer.

O.K. CLUTCH & MACHINERY CO.
1094 Florence St Columbia Penna

J. A. Robinson

The appointment of J. A. Robinson as sales manager has been announced by Viber Company, Burbank, Calif.

Mr. Robinson was five years with the McGraw Hill Company, serving as western editor of *Electrical World*. Prior to that he had been in the eastern factories and San Francisco offices of General Electric. He is a graduate of the University of California in electrical engineering.

Eugene C. Bauer Jr., first vice-president of Kensington Steel Company, Chicago, Ill., was elected a director of Pioneer Engineering Works. He succeeds Philip W. Moore, formerly president of Poor & Company, and a member of the board, who resigned because of ill health.

The appointment of Brown-Bevis-Industrial Equipment Company, 4441 Santa Fe Avenue, Los Angeles, California, as distributor for Bucyrus-Erie tractor equipment was announced recently.

Elmer A. Stevens, Akron, Ohio, became treasurer of the B. F. Goodrich Company September 1, according to an announcement.

The promotion of H. S. Johnson to director of merchandising, L. M. Atwood to assistant general sales manager and J. H. Alsen to director of engineering applications of the Boston Woven Hose and Rubber Company, Cambridge, Mass. was announced.

W. C. van Dyck has been advanced to assistant manager of education and training at Caterpillar Tractor Co., Peoria, Ill.

He was formerly supervisor of college graduate training at Caterpillar. He will continue to direct this work as part of his expanded duties.

Joseph Carcione, 47, purchasing agent of the Easton Car & Construction Company since 1934, died recently at Maniwaki, Quebec, Canada, where he was spending a week fishing.

Richard T. Bules has been appointed manager, V-Belt Sales, industrial products sales department, for The B. F. Goodrich Company. He succeeds George J. Fischer who resigned recently.

The appointment of D. H. Kennedy as western sales manager, International Paper Company, Southern Kraft Division, succeeding the late Raymond Bee, was announced.

The appointment of J. D. Dooley as assistant western sales manager—kraft linerboard sales, and N. P. Sparkman as assistant western sales manager—kraft paper and bag sales, were also announced.

Fairbanks, Morse & Co., Chicago manufacturers, announce the following recent changes in personnel:

W. E. Watson, who has for several years been manager of the Pump Manufacturing Division of the company, has been promoted to assistant to the manager of manufacturing with headquarters in Chicago.

Paul R. Flood who, since 1950, has been manager of manufacturing of the company's Beloit, Wis., Works, has been transferred to Pomona, Calif., where he has been appointed general manager of the company's Pomona Pump Works succeeding Charles L. Barrett who has become a consultant to the Pump Division.

Lewis H. Kessler has been named chief hydraulic engineer at the company's Beloit Works. He succeeds R. C. Glazebrook who has been on special assignment to the general manager with duties relating to the new Fairbanks-Morse plant now under construction in Kansas City, Mo.

Robert B. Craig, formerly R.E.A. Deputy Administrator and Diesel Engine Manufacturers Association representative, has been appointed assistant to the president of Fairbanks, Morse & Co., working on special assignment. His headquarters are in the Washington office.

S. L. Fry, formerly manager of the company's Omaha Branch Diesel Department, has recently been appointed assistant manager of the Pump Sales Division with headquarters in Chicago.

G. E. Allen

The appointment of Gale E. Allen as supervisor of Trackson products promotion at the Caterpillar Tractor Company, Peoria, Ill., has been announced. Trackson, which manufactures auxiliary products for Caterpillar equipment, is now a wholly-owned subsidiary.

Mr. Allen, who was domestic sales manager for Trackson Company, had been with that company since 1942. From 1929 to 1939, he held various positions with Caterpillar at Peoria, including that of special representative in the sales department.

The Jeffrey Manufacturing Company, Columbus, Ohio announces changes in its district office personnel: Carl Verhine of the Columbus office has been added to the Milwaukee sales staff: J. A. Lowry has been transferred to the home office from New York; and Elmer Longnecker goes to Detroit from the Columbus distric office, replacing Robert Monsarrat who has been named manager of the Philadelphia District Office.

International Paper Company announced the opening of a new Bagpak Division Sales Office in Kansas City, Kansas. O. W. McDuffie has been named to head the office which will be located at 401 Kindelberger Road in the plant opened earlier this year.

Dick Lewis

Dan Daily

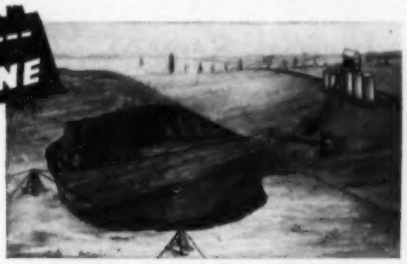
The Frank G. Hough Co., Libertyville, Ill., has announced the assignment of two new district representatives replacing Jim Suter, who has become associated with Cornhusker Tractor and Equipment Company, North Platte, Nebr.

The new men are Dan Daily and Dick Lewis. Mr. Daily will headquarter at Minneapolis and cover Sales District 4, comprising North and South Dakota, Minnesota, Iowa, Wisconsin, and upper Michigan.

Mr. Lewis will headquarter at Kansas City, Mo., and will cover Sales District 5, comprising western Missouri, Wyoming, Nebraska, Kansas, and Colorado.

Blaw-Knox Company, Pittsburgh, Pa., has appointed George L. Dirks to the position of general manager of its Blaw-Knox Division at Blawnox, Pa. He succeeds D. V. Sherlock, who returned from retirement to serve temporarily as acting general manager of this division.

ONE MAN----- ONE MACHINE

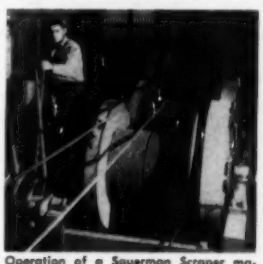


VERSATILE
EFFICIENT
ECONOMICAL

Picture shows how a Sauerman Drag Scraper equipped for rapid shifting makes fast work of cutting down a large hill of hard-packed gravel.

SAUERMAN SCRAPER

Sauerman Scraper stores and reclaims 150,000 tons of crushed stone on space between dock and cement mill.



Operation of a Sauerman Scraper machine is an easy one-man job because of the unique Sauerman roller bearing hoist.

VERSATILE: The Sauerman Power Drag Scraper can be readily set up for stripping of overburden, wet or dry excavation of aggregate, haulage to plant or stockpile, and loading for storage or delivery. Even on the most difficult jobs, only one man is required to dig, haul, stockpile or load in one continuous cycle. Bucket sizes 1/3- to 15-cu. yds.

EFFICIENT: Finger-tip controlled from a safe, comfortable operating station, the scraper is easily guided over a large area. The unique bottomless Crescent scraper readily penetrates hard materials, gathers a full load, hauls to the discharge point, and dumps cleanly and quickly. Depending on the length of the span, 20 to more than 40 loads can be moved per hour.

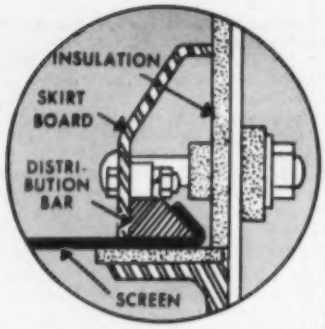
ECONOMICAL: Labor and equipment is reduced to a minimum by using the Sauerman Scraper. Installation is moderate in cost. Simplicity of design, plus the fact that only the most expendable parts come in contact with the material handled, results in low maintenance. Gasoline, diesel, or electric power consumption is light.

For Complete facts send for Catalog A.

Rope Haulage Equipment Specialists Since 1909

SAUERMAN BROS., Inc.

534 S. Clinton St. Chicago 7, Ill.



this exclusive HANCO feature insures

Highest Screen Heating Efficiency

Hanco Electric Screen Heaters heat woven screens to

- Speed screening of moist materials.
- Eliminate labor of cleaning to keep mesh open.
- Save wear caused by cleaning, extra weight.

The Hanco Quick-Change Attachment makes screen changes easy . . . insures uniform, efficient heating.

- Copper distribution bars make positive, direct contact with screen cloth, eliminating current loss suffered when skirtboard is part of circuit.
- Contact cannot be broken or weakened by rust.
- Distribution bars shielded against abrasion.
- Minimum insulation used.

Write for Bulletin 521

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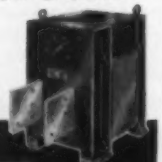
Engineers
• Since 1926 •
Manufacturers
CANTON 7, OHIO



Hanco THE PIONEER
ELECTRIC SCREEN HEATER

R. C. Clark

Electric Machinery Mfg. Company, Minneapolis, Minn., has announced the establishment of a new sales office at Harrisburg, Pa. Richard C. Clark will be in charge. This office replaces the former sales office at York, Pa.

Mr. Clark is a graduate of Penn State University in electrical engineering, and has a background of engineering and sales engineering experience with the General Electric Company. The new office is located at 221 North Second Street, Harrisburg, Pa.

The Cantwell Machinery Company, Columbus, Ohio, has been appointed distributor for McLanahan and Stone Corporation for the state of Ohio. Thomas E. Morgan is sales manager for the company.

Richard A. Berger has joined the Kraft Bag Corporation, 630 Fifth Ave., New York, N. Y., as an administrative assistant and salesman for the New York state territory. He formerly was with the St. Regis Paper Company.

F. E. Peltier has been named manager of the Central Regional Engineering and Service of the Worthington Corporation, Harrison, N. J. He will supervise engineering and service in the district offices in Detroit, Cincinnati, Buffalo, Pittsburgh, and Cleveland.

W. J. Stebler was recently elected executive vice-president of the General American Transportation Corporation, Chicago, Ill., by the Board of Directors.

Officials of the Rex Oil and Chemical Company, 9120 Loren Avenue, Cleveland 5, Ohio, announce that Don E. Hodgson has been appointed secretary of the company. He will have complete charge of plant and office operations of the company.

For the last three and one-half years Mr. Hodgson has headed the sales department of the Pennsylvania Refining Company. Prior to that time he was associated with The Warren Refining & Chemical Company for eight years, serving as purchasing agent and assistant sales manager.

Cottrell Farrell, president of Easton Car and Construction Company, Easton, Pa., is visiting cement producing centers in France and Italy. Many quarries in western Europe are now using American built side-dump semi-trailers and truck bodies. Side-dump trailers and truck bodies of EASTON design are also built in Europe under a regional manufacturing agreement. Mr. Farrell plans to study the manufacturing methods and facilities provided through Societe E. Constatin, Paris, and Dario Sobrino, Milan. He also expects to review the possibilities for introducing side-dump haulage equipment to other markets.

Are you getting these

Extra Dividends

from *Red-Strand Preformed*

WIRE ROPE? Again and again Hercules *Red-Strand* Preformed wire rope outlasts others . . . speeds up operations . . . saves time and money.

Leschen's precise care, close attention to detail, and exacting insistence upon higher-than-rated quality *consistently* pays off in better service . . . with Hercules *Red-Strand* Preformed wire rope.

Make your next order Hercules *Red-Strand* Preformed. You'll discover the difference for yourself.

A. LESCHEN & SONS ROPE CO.
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In business only to make better wire rope since 1857.

DISTRIBUTORS IN ALL PRINCIPAL CITIES

SYNTRON

"Vibrating"

TEST SIEVE SHAKERS

Eliminate all Guesswork

Provide definite sizing of test samples

- Use standard 8" Screen Scale Testing Sieves
- A reset timer for accurately timed test periods
- Controlled electromagnetic vibration—no motors, pulleys, etc.

Write Today for FREE Catalog Folder

SYNTRON CO.
385 Carson Ave. Homer City, Pa.

Union Bag and Paper Corporation has announced the appointment of E. T. Nelson as assistant western district sales manager for Multiwall bags. He will headquarter in the Chicago office.

E. T. Nelson

Mr. Nelson joined the Union Bag and Paper organization in 1928. Prior to his new appointment he had been a field representative for Multiwall bag sales in the Minneapolis area.

Walter S. Schamel has been appointed district manager of the Los Angeles office of American Wheelabrator & Equipment Corporation. He will have offices at 3155 Leonis Blvd., Vernon, Los Angeles 58, and handle the company's complete line of products, including dust collectors, abrasive blasting machines, and other foundry equipment.

Kraft Bag Corporation, New York, manufacturers, announced the appointment of James M. Gager Jr. to its sales staff. He will cover Tennessee, Georgia, South Carolina and part of North Carolina, from headquarters in Chattanooga, Tenn. Mr. Gager has a practical knowledge of production and operation gained previously as a proprietor of The Gager Lime Company.

A. B. Fisher Jr. has been appointed a vice president of Koppers Company, Inc., in the Engineering and Construction Division, it was announced. In this post Mr. Fisher will serve as executive assistant to the general manager and assistant general manager of the division.

C. A. Franklin Jr. has been appointed western district sales manager of the New York Belting and Packing Company, it was announced recently. His territory extends from the Rocky Mountain states to the West Coast, from the Canadian border to the Mexican border and the Hawaiian Islands. He succeeds O. L. Wall who died June 29.

W. A. Finn has been named assistant general sales manager of Worthington Corporation according to an announcement. Mr. Finn is returning from Paris, France, where he has been serving as General European Manager, and will make his headquarters at the Harrison, N. J., offices.

Syntron Company, Homer City, Pa., has organized a Canadian subsidiary, Syntron Ltd., and purchased a manufacturing plant in Stoney Creek (Hamilton area) Ontario, Canada.

Alan J. Bronold, Sales Vice President, of Sterling Electric Motors, Inc. has just announced appointment of the following additional distributors for Sterling Electric Power Drives. Cascade Industrial Supply, Inc., 515 Market Street, Klamath Falls, Oregon; Selma Foundry & Machine Co., P. O. Box 662, Selma, Alabama; W. S. Wilson Corp., 11 So. William Street, New York 4, New York; Roger Brown Company, 111 E. Missouri, El Paso, Texas; Herr Electric Company, 410 W. Conway Street, Baltimore 30, Maryland; Story Electric Motor Repair Co., 269 Paterson Ave., Little Falls, New Jersey; Woodbury & Company, 133 S. W. 2nd Avenue, Portland, Oregon.

The appointment of new branch managers of The Howe Scale Company, Rutland, Vt., was announced recently.

Donald P. Berne, formerly sales representative at the Cincinnati branch, has been promoted to Minneapolis branch manager. This branch is located at 404 Washington Avenue, N., Minneapolis 1, Minn.

William J. Tucey has advanced to the position of San Francisco branch manager, replacing Lierd E. Grant who transferred to Los Angeles branch manager. These branches are located at 124 Fourth St., San Francisco 3, Calif., and at 1237 East Eighth St., Los Angeles 21, Calif.

"RUGGED INDIVIDUAL" OF A PUMP

"TELL-TALE"
New Type C
Centrifugal
Sand and Gravel Pump

Built STRONGER to last LONGER

New BULLETIN sent on Request

YOUR PUMPING TROUBLES ARE OVER after you install this husky, smooth-working unit. It's designed and constructed for long, high-economy service under all operating conditions. Strong, one-piece stands with self-aligning SKF bearings reduce vibration and wear. Larger impeller hub minimizes breakage and shut-downs.

Now offered in the 6" size, with either semi-steel or "best-in-the-long" run Ni-Hard working parts. Other sizes soon available.

PEKOR IRON WORKS, INC.
LOCK DRAWER 909 ESTABLISHED 1892 COLUMBUS, GEORGIA

Pulverizers

Have you investigated our new BRADLEY HERCULES MILL? Unquestionably the last word in Economy and Simplicity.

(Send for New Catalog No. 39)

BRADLEY PULVERIZER CO.
ALLENTOWN, PENNA.

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1953
LIGHTWEIGHT AGGREGATE MAP

***ENTIRELY NEW* — detailed and informative**

Provides an accurate up-to-the-minute list of all known producers, (established and newcomers alike) including individual company names, location of each plant and lightweight aggregate produced. Over 240 plants listed.

Fully covers the field—cinders, diatomite, expanded clay, shale, slag, etc. An authoritative and indispensable map that is a year-round source of information.

Printed in handy 17" x 22" size for wall or desk use and folds to a convenient size for filing or carrying.

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Send request on your business letterhead. The supply is limited so place your order now. Distribution will be on the first come, first served basis. Write to:

CONCRETE MANUFACTURER
PIT AND QUARRY PUBLICATIONS
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COMPLETE CRUSHING PLANTS
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Farrel-Bacon provides a complete engineering service, including design of plant and supplying all equipment from primary crusher to bin gate. Jaw-type crushers are available in sizes from 60" x 48" to 10" x 7" *Write for complete information.*

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ANSONIA, CONNECTICUT

BA-5

Several personnel changes have been announced by Worthington Corporation, Harrison, N. J.

Paul J. Foley has been named manager of the Kansas City office to succeed W. R. Kennedy, who will become a consultant. Mr. Foley was formerly manager of the Milwaukee branch office. Succeeding Mr. Foley at Milwaukee will be William M. Fine, a former member of the firm's sales organization in Chicago.

Herbert J. Meeker, assistant to the vice-president, has retired after 50 years with the company.

Ralph M. Watson has been appointed director of research. He was formerly assistant to the vice-president in charge of engineering. He succeeds Paul Diserens, who has been retired after 43 years with the company.

John W. Queen has been appointed manager of the Cleveland plant of Joseph T. Ryerson & Son, Inc., Chicago, Ill. Mr. Queen has been with the company since 1933 and has held several posts including that of manager of the alloy steel division. He succeeds William O. Springer who has been transferred to special administrative duties in the East.

The Heil Co., Milwaukee 1, Wis., announced a revision of the district sales territories with the opening of two new district office locations and numerous personnel changes in the field sales organization. The new district offices will be opened in Cleveland and Denver. The personnel changes resulting from this program are as follows: Robert Rose, formerly district representative at Hillside office becomes district manager of the Hillside office. Fred Wrede, formerly special representative at the Washington office becomes district manager of the office. William Schumacher, formerly district manager of Hillside office becomes district manager of Cleveland office. Herbert Erdman, formerly assistant sales manager of the Tank Division, Milwaukee, becomes district manager of the Milwaukee office. John Zimmermann, formerly district representative at the Milwaukee office becomes district manager of the Denver office. D. J. Kuhlman, formerly manager Chicago national accounts office becomes district manager of the Chicago office.

Kempton Dunn was elected a director of American Brake Shoe Company at the meeting of the Board of Directors recently. He is a vice-president and treasurer of the company.

Mr. Dunn has been with Brake Shoe since 1932. He became treasurer in 1942 and was secretary of the company from 1947 to 1949.

John C. Durbin, Jr. has been appointed a factory sales representative for New York Belting & Packing Company in Washington, Oregon and Idaho, according to an announcement.

Mr. Durbin will make his headquarters in Portland, Ore. For the past several years, he has been associated with the company's San Francisco staff.

traffic news

CENTRAL TERRITORY RAILROADS COMMITTEE

Docket 89056 (1)—Proposed to establish on crushed stone, in open-top equipment, carload minimum weight 90 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight will apply from Monon, Ind., to Ionia, Mich., 228 cents net ton; to Lowell, Mich., 219 cents net ton.

Docket 89061 (1)—Proposed to establish on stone, crushed and crushed stone screenings, in bulk, in open-top cars, carload, minimum weight 70 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight will apply from North Vernon, Ind., to Indianapolis, 89 cents net ton.

Docket 89062 (2)—Proposed to establish on dolomite, stone, crude or raw, carload minimum weight marked capacity of car from Woodville, Ohio, to East Lake, Mich., 231 cents net ton in open cars.

CENTRAL TERRITORY RAILROADS FREIGHT TRAFFIC COMMITTEE

Docket 89089 (1)—Proposed to establish on crushed stone, crushed stone screenings, crushed stone tailings, loaded in open cars only, minimum weight 90 percent of marked capacity of car, except that when car is loaded to full visible or cubical capacity, actual weight will apply from Carey, Ohio, to New London, Ohio, 76 cents net ton. Issued to meet motor truck competition.

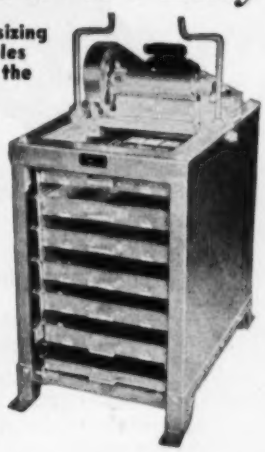
Docket 89023—Proposed to establish on agricultural limestone, carloads, in bulk, in open-top cars, not protected by tarpaulin or other protective coverings, minimum weight 90 percent of market weight capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight will apply from Joliet, Ill., to Buchanan and Niles, Mich., 113 cents; to Dowagiac, Decatur, and Lawton, Mich., 125 cents; to Kalamazoo, Mich., 138 cents net ton. Rates are subject to Ex Parte 175-B increase.

Docket 89090 (1)—Proposed to establish on crushed stone or crushed stone screenings, in bulk, in open-top cars, minimum weight 90 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight will apply from Spore, Ohio, to Shelby, Ohio, 76 cents net ton.

NOW it's Easy

test-sizing samples with the

GILSON SCREEN



KNOW your product will rate "tops" in uniformity! A GILSON separation test provides vital information fast and accurately. Sizes sand, gravel, etc., in a range of 4" to 200-mesh. Write for details.

GILSON SCREEN CO.
BOX 186 MERCER, PA.

Riggers PLAY IT SAFE on "high wire" jobs!

...that's why they demand GENUINE

CROSBY CLIPS

Drop-forged, hot-dip galvanized wire rope fasteners
SIZES FOR ⅛" TO 3" WIRE ROPE
DISTRIBUTORS EVERYWHERE

AMERICAN HOIST & DERRICK CO.
ST. PAUL 1, MINNESOTA

HE SAYS THAT NEXT MONTH HUDSON WILL MAKE MULTIWALL HISTORY!

You'll beat the drum for Hudson, too, when you soon see the announcement from this fully integrated mill.

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ONLY ROCK BIT OFFERS THIS...

Threaded for Rok-Bit R-1, H or D thread to fit any of the following sizes: ⅞" Hex. or O.O.; 1" Hex. or O.O.; 1⅛" or 1¼" Rd. For jack hammer, wagon drill steels, etc. Special threads on request.

hole saving reclaiming tool

The Rock Bit Hole-Saver is used to reclaim lost bits and broken drill steel, so as to save both tools and hole. The tool threads itself securely onto the part to be recovered, removing it quickly and easily. Field proved! One user writes: "The Hole-Saver retrieved three carbide bits valued at $22.50 each the first day in use." Moderately priced. Write for FREE folder. Rock Bit Sales & Service Co., 2514 E. Cumberland St., Philadelphia 25, Pa. — 350 Depot St., Asheville, N. C.

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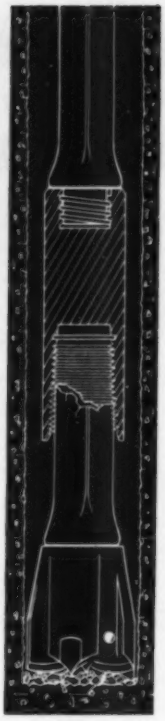
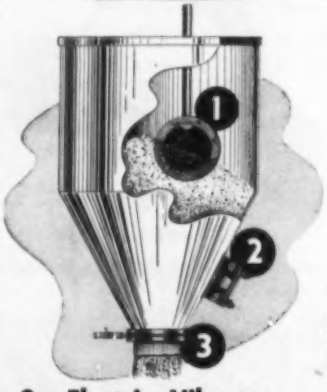
SALES AND SERVICE CO.



for Complete Hopper Efficiency—

SYNTRON



1. Hopper Level Switches

Eliminate spillage and shortage of materials. Automatically maintain desired levels of materials—from fine to coarse—in bins and hoppers. Control feeding.

2. Electric Vibrators

Assure free-flowing bins, hoppers and chutes. Eliminate arching and plugging of materials without hammering and rodding that damages equipment and wastes manpower.

3. Flow Control Valves

Control flow of bulk materials from bins, hoppers and chutes. Rotating control lever increases or decreases opening of flexible iris type diaphragm and flow of material without jamming and clogging.

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SYNTRON COMPANY
385 Carson Avenue Homer City, Penna.

NORTH PACIFIC COAST FREIGHT BUREAU

Docket NC-2791 (S)—Proposed request to reduce rates on 40 tons and 50 tons kiln dust, agricultural lime, carload, from Gold Hill, Ore., to following Oregon points: Myrtle Creek, Roseburg, Drain, Cottage Grove, Eugene, Junction City, Albany, Salem, Woodburn, Canby, Oregon City, Corvallis, Independence, Amity, McMinnville, Forest Grove, Tigard, Toledo, Noti, Mapleton, Reedsport, Coos Bay and Coquille.

Docket TL M-2253 (Shipper)—Proposed to establish on limestone, crude, fluxing, foundry and furnace, carload, in open-top equipment, minimum weight 90 percent of marked capacity of car from Bellefonte, Pleasant Gap, Chemical, and Howard, Pa., to Milton, Pa., $1.76 per gross ton, subject to Ex Parte 175 increase.

Docket TL M-2257 (Shipper)—Proposed to establish on limestone, ground (except agricultural limestone or ground limestone, for acid soil treatment) in bulk or in packages, carload minimum weight 30 tons, from Kimballton, Va., to Richmond, Va., $2.55 per net ton in open-top cars not protected by tarpaulin or other protective covering; $2.98 per net ton in closed or open-top cars protected by tarpaulin or other protective covering, subject to Ex Parte 175 increases.

Docket TL M-2260 (Shipper)—Proposed to establish on crushed stone (will not include agricultural limstone or ground limestone, unburned, fluxing stone or firestone, or stone coated with oil, tar, or asphaltum), carload minimum weight 90 percent of marked capacity of car from Dowington, Pa., to Dennisville, N. J., $1.80 per net ton, subject to Ex Parte 175 increase. To be issued to meet motor truck competition.

Docket TL M-2279 (Shipper)—Proposed to establish on stone, crushed, coated with oil, tar or asphaltum, in bulk, in open-top cars, in straight carloads, minimum weight 90 percent of marked capacity of car, etc., from Glen Mills, Pa., to Winfield, Pa., $2.98 per net ton, subject to Ex Parte 175 increase. The oil, tar, or asphaltum not to exceed 10 percent by weight of the commodity as shipped, the shipper to so certify on shipping orders or bills of lading.

Docket TL M-2308 (Shipper)—Proposed to establish on crushed stone, carload, minimum weight 90 percent of marked capacity of car, from Leroy, N. Y., to Coudersport, Roulette, and Gold, Pa., etc., $1.97 per net ton, subject to Ex Parte 175 increase. To be issued to meet motor truck competition.

Western Trunk Line Committee

Docket X-E-41-1627 (S)—Proposed to establish a rate of 8.8 cents per 100 lb. in open cars and 9.8 cents per 100 lb. in closed cars on agricultural limestone, carload, minimum weight 90 percent of marked capacity of car. When cars are not weighed, minimum weight will be marked capacity of car. From Mayville, Wis., to Medford, Athens, and Lublin, Wis. Above rates subject to X-175 increase.

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comfortable
eye protection

keep on
the safe
side

wear
WILLSON
GOGGLES

Willson goggles offer you greatest value because they are carefully designed for comfort and appearance as well as for the eye protection you need. Choose from a wide range of Cup and Cover-All* types like those illustrated. All are fitted with Super-Tough* heat-treated glass lenses—all fully pre-tested. You're sure when you ask for Willson goggles—safer when you wear them.

COVER-ALL®
CUP GOGGLE
No. CC60

Heavy duty goggles allowing plenty of room for prescription glasses to be worn safely and comfortably.

RUBBER MASK
GOGGLE
No. X41

Ideal for chemical workers. Rolled inner edge makes them fit snugly with utmost ease.

STYLE
DL31

Deep perforated metal cups provide direct ventilation yet exclude dust. Ideal for use in hot, dusty atmospheres.

See your Willson distributor or write for bulletin

WILLSON PRODUCTS, INC.
102 Thorn Street, Reading, Pennsylvania

GENERAL FREIGHT TRAFFIC COMMITTEE
Eastern Railroads

Bulletin G-6421 (Shipper)—Proposed to establish on limestone, natural, ground or pulverized, carload minimum weight 30 tons from Conneaut, Ohio, to Collier, Pa., $2.86 per net ton in open-top cars not protected by tarpaulin or other protective covering, and $3.36 per net ton in closed cars or open-top cars protected by tarpaulin or other protective covering, subject to Ex Parte 175 increase, in lieu of current classification basis. Rates named herein will also apply on limestone, ground or pulverized, when containing not in excess of 3 percent of other minerals either physically or otherwise added.

Bulletin G-6428 (Carrier)—Proposed to establish on limestone, natural, ground or pulverized (unburned) stone screenings, crushed, not ground or pulverized (unburned) stone dust (unburned), carloads, minimum weight 60,000 lb. from Piqua, Ohio, to Montreal, W. Va., $3.10 per net ton in open-top cars; $3.60 per net ton in closed cars, subject to Ex Parte 175 increase, in lieu of combination basis. Rates named will also apply on limestone, ground or pulverized, when contaning not in excess of 3 percent of other minerals either physically or otherwise added.

Bulletin G-6352 (Shipper)—Proposed to establish on sand, in open-top cars, carload minimum weight 90 percent of marked capacity of car from New Martinsville, W. Va., to Dunbar, Pa., $1.70 per net ton, subject to Ex Parte 175 increase.

Bulletin G-6360 (Carrier)—Proposed to establish on stone, that is, roofing granules, in closed cars or open cars protected by tarpaulin or other protective coverings, minimum weight 25 tons, from Dundee, N. J., to St. John, N. B., $9.64 per net ton, subject to Ex Parte 175 increase.

Bulletin G-6378 (Shipper)—Proposed to establish on sand, in open-top cars, carload minimum weight 90 percent of marked capacity of car, etc., from New Martinsville, W. Va., to Dunbar, Pa., $1.70 per net ton, subject to Ex Parte 175 increase.

ILLINOIS FREIGHT ASSOCIATION

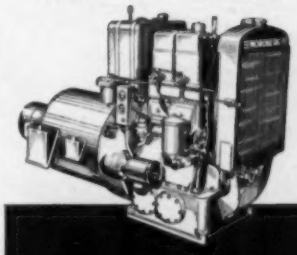
Application IRC 511-1183 (MRP 6285)—Proposed to establish on crushed stone, in open-top cars, minimum weight 90 percent of marked capacity of car, except that when car is loaded to full cubical or visible capacity, actual weight will apply from Anna, Ill., to Mt. Vernon, Ill. Present: $1.38 per net ton of 2,000 lb. plus 12 percent X-175-B, I.C.R.R. Tariff 13321-J, Ill. CCA-1743. Proposed: $1.32 per net ton of 2,000 lb. plus 12 percent X-175-B, I.C.R.R. Tariff 13321-J, Ill. CCA-1743.

PACIFIC SOUTHCOAST FREIGHT BUREAU

Docket 2946 (S)—Proposed to establish on lime, common, hydrated, quick or slaked, carload, Nelson to Nogales, Ariz., rate 45 cents, minimum 40 tons.

Docket 2962 (S)—Proposed to establish on rock, silica, carload, Dunn and Field, Calif., to Colton and Crestmore, Calif., 6 cents per hundredweight, not subject to X-175; minimum 50 tons.

HERE IS "Packaged"
DIESEL POWER
AT ITS BEST!



. . . use NORDBERG DIESELS to solve a wide range of power problems

• Nordberg Type 4FS "Packaged" Diesel Power Units were developed to meet the need for simple, compact, dependable units capable of continuous heavy duty service. They are built in 1, 2, and 3-cylinder models, developing from 10 to 45 horsepower or 6,000 to 30,000 watts at *medium* engine speed to stand the gaff of all kinds of tough jobs.

The 4FS series incorporates the same high standards of design, construction and performance that have been identified with world-famous Nordberg Diesels for over 35 years. For electric power, for pumping, for energizing lifting magnets, and for scores of straight power applications . . . you just can't beat the reliability, low operating cost and minimum maintenance offered through the use of Nordberg 4FS Diesels.

NORDBERG MFG. CO., Milwaukee, Wis.

NORDBERG
BUILDERS OF AMERICA'S LARGEST LINE OF HEAVY-DUTY DIESELS

Mail This Coupon Today

Nordberg Mfg. Co., Milwaukee, Wisconsin

Send catalog covering Nordberg Type 4FS Diesels. I am interested in a unit for the following service:

_____

Your Name_____

Company Name_____

Address_____

City_____ Zone____ State_____

4-552-ICQFMOP

Hauls 82,476 tons of

Dunn Limestone Company, Inc.

Pulverized Limestone Products

Spencer, Indiana

STATEMENT OF HAULING OPERATIONS

Period: 6 months, May through October
Haul Units: Two 9-ton rear-dump LeTourneau Tournarockers

MATERIAL MOVED DURING PERIOD

Rock	79,923 tons
Limestone	2,493 tons
Fluxing Stone	60 tons
TOTAL AMOUNT	82,476 tons

OPERATING COSTS

Operators' Wages	$2,759.54	
Fuel	375.62	
Lubricants, etc.	120.06	
Cable	5.00	
Repairs (Batteries and Filter)	164.25	
Insurance, Interest and Taxes	328.48	
Depreciation	3,270.90	
TOTAL COSTS		$7,233.85
Total hours charged for period	1932.0	
Less stripping, painting time	250.5	
TOTAL TIME CHARGED TO HAULING		1681.5 hours

BREAKDOWN OF COSTS

$7,233.85 total costs / 1932 hours gross time = $3.744 Cost per hour

1681.5 net hauling hours × $3.744 cost per hour = $6,295.54 total hauling costs

$6,295.54 total hauling costs / 82,476 total tons moved = $0.0763 Hauling cost per ton

HAULING PRODUCTION TIME STUDY

Period: 6 months, May through October
Haul Units: Two 9-ton rear-dump LeTourneau Tournarockers

TIME RECORD

Total hours charged for period		1,932
Less Stripping Time	250.5	
Less Greasing and Servicing Time	81.5	
TOTAL HAULING HOURS		1,600

MATERIAL MOVED BY HAULERS

Material	Direction	No. of Loads	No. of Tons
Rock	From Quarry to Crusher	7,477	79,923
Limestone	From Plant to Railroad	247	2,493
Fluxing Stone	From Plant to Railroad	6	60
TOTAL MOVED DURING PERIOD		7,730	82,476

7,730 loads / 1600 hours = 4.83 loads per hour per unit

82,476 tons / 1600 hours = 51.54 tons per hour per unit

FUEL CONSUMPTION

Total fuel used during period: 2,573 gallons

Total Hours Charged 1,932
Less Greasing and Servicing Time 81.5

ACTUAL RUNNING TIME 1,850.5 hours

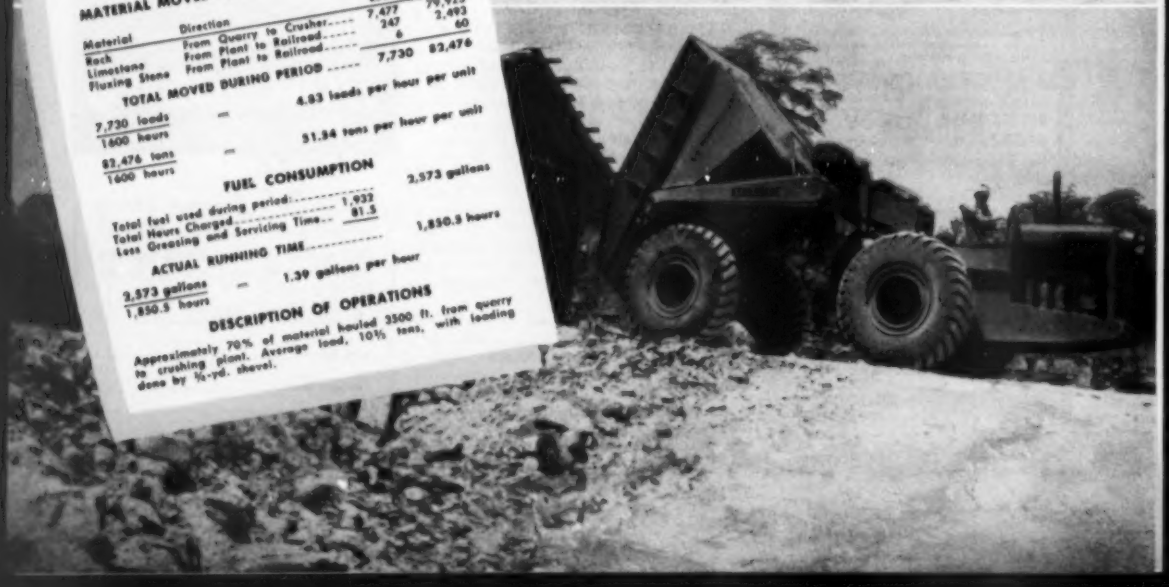
2,573 gallons / 1,850.5 hours = 1.39 gallons per hour

DESCRIPTION OF OPERATIONS

Approximately 70% of material hauled 2500 ft. from quarry to crushing plant. Average load, 10½ tons, with loading done by ¾-yd. shovel.

"Tournarockers have plenty of power to carry any load we place on them," says Operator Gerald R. Summuldt. "I like them very much." Big 4-wheel multi-disc air brakes add confidence for safe, fast hauls.

Load is dumped at crusher. Occasionally, rig also hauls finished product to railroad cars which are along line of haul from quarry to mill. Operator Summuldt says, "Tournarockers are easy to handle — especially in these close places — due to their short turning radius."



rock at 7.6c per ton

Dunn Limestone Co. averages 103 tons hourly over 6-month period with two 9-ton Tournarockers

Cost and production records are "proof of the pudding" as far as Dunn Limestone Company, Inc. of Spencer, Indiana, is concerned. Formerly, all their rock was hauled from quarry to crushing plant by 1½-ton trucks. Early in 1951 the trucks were replaced with 2 electric-control, rear-dump 9-ton D Tournarockers, with the following "very satisfactory" results (as based on the company's own figures over a 6-month period):

Loaded by a ¾-yd. shovel at the quarry, each high-speed "Rocker" moved 10⅔ tons of blasted quarry-run rock to the crusher every 12 minutes. Rigs made 4.8 trips per hour over a 7000′ cycle . . . also handled some haul-back of limestone and crushed rock to rail cars. In 1,600 hauling hours, the 2 Tournarockers delivered a total of 82,476 tons (7,730 loads), for an average of 51½ tons per hour per unit.

Over 1,932 total operating hours, total costs (including operator wages, fuel, oil, repairs, insurance, interest, taxes and depreciation) averaged $3.74 per hour . . . or *7.63c per ton of rock hauled.* No wonder Company Vice-President John D. Beem says, "These actual operating figures over a six months' period convinced us that Tournarockers are handling our job on a very satisfactory basis!"

On 7000′ cycle, rig averages 15 m.p.h., often hits top of 28 m.p.h. "These rigs do our job perfectly," says Foreman Eldath Lacy, "I wouldn't trade them for any other hauling units on the market today."

Whenever *you* have rock, dirt, or ore to haul, it will pay you to investigate the savings possible with Tournarockers. There's a size to fit your needs . . . 9, 18, 35 and 50 tons. See your LeTourneau Distributor for full details.

Tournarocker is loaded with 10 to 11 tons of pit-run rock in an average of 7½ minutes.

Tournarocker—Trademark Reg. U. S. Pat. Off. DR-146-Q

R. G. LeTOURNEAU, INC.

Peoria, Illinois

LeTOURNEAU EQUIPMENT

for handling practically any materials... from aggregates to asparagus...

Thermoid has the right conveyor belt for your job

From years of experience in materials handling problems, Thermoid has developed a full line of superior Conveyor Belting. Only the finest materials are used, scientifically compounded to withstand wear and carry the load dependably. This extra margin of endurance means fewer delays due to belt breakage or premature wear.

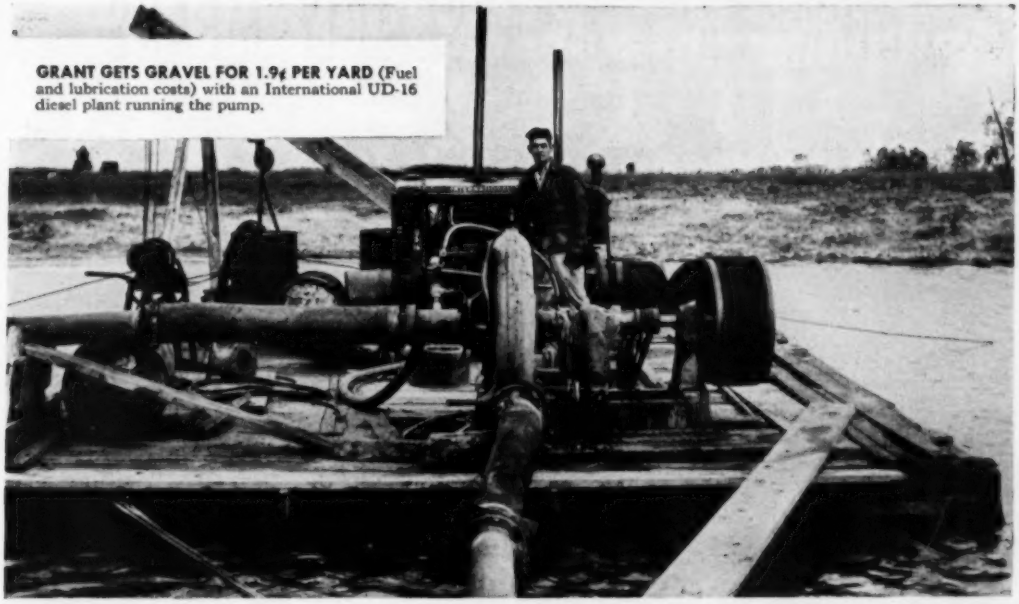
Whether you are handling boxes, bags, cartons . . . stone, sand, gravel or other aggregates—consult your Thermoid distributor. He can recommend the right type of Thermoid Belt to do the job at the lowest cost per ton of material moved. Write today for your copy of the Thermoid Conveyor Belting Catalog. No. 3679.

Conveyor & Elevator Belting • Transmission Belting
F.H.P. & Multiple V-Belts • Wrapped & Molded Hose

Thermoid

Rubber Sheet Packings • Molded Products
Industrial Brake Linings and Friction Materials

Thermoid Company • Offices & Factories: Trenton, N. J., Nephi, Utah



GRANT GETS GRAVEL FOR 1.9¢ PER YARD (Fuel and lubrication costs) with an International UD-16 diesel plant running the pump.

Quarry Master in Nebraska

15 HOURS A DAY—is a normal task for the UD-16 lifting gravel 65 feet from pit bottom.

UD-16 Provides Steady Low-Cost Power Pumping Gravel for Asphalt Mix

Lyle S. Gearhart, Superintendent of Grant Construction Company, Grand Island, Nebraska, gives the low-down on his International UD-16 power unit.

"You can't beat her for easy starting, and she pumps a good 600 yards every day on a 15 hour schedule," he says. "She delivers the gravel 150 feet on the level with a rise of 65 feet from the pond bottom up to the screen and hopper."

All this means that Grant gets gravel at a cost of 1.9¢ per yard for fuel and lubrication. This kind of low cost power is the reason why gravel quarries all over the country are putting International units behind their pumps, crushers and conveyors.

Find out what your International Industrial Distributor or Power Unit Dealer can do for you. See why it pays to power with International.

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILLINOIS

SEE YOU AT THE POLLS!

INTERNATIONAL

POWER THAT PAYS

QUICK, EASY DISASSEMBLY MEANS

Low Service Cost

1. Disconnect drive, loosen casing bolts and lift bolt assembly from slot. Bolt, nut and washers are still connected for easy reassembly.

ALLIS-CHALMERS

COAL WASHING PUMP

2. Swing out rotating element. Neither suction nor discharge piping is disturbed. All wearing parts are fully accessible for inspection or servicing.

Back in Service in less than a Half Hour

ALLIS-CHALMERS

Coal Washing Pump

Only 5 Wearing Parts

Shaft sleeve, impeller, casing, two wear plates. All easy to handle and easy to replace.

YOU CAN SEE for yourself how quick and easy it is to service an Allis-Chalmers Solids Handling Pump. Fast servicing like this plus long runs between servicing keeps your pumping costs low.

You get long life from Allis-Chalmers Coal Washing Pumps, too, because they are made of special hard *Allisite* alloy . . . because they have thick sections and heavy parts throughout . . . and because they are application engineered by specialists who know coal washing problems and how to solve them. Allis-Chalmers can supply the complete pumping unit — pump, motor, drive and control — of matched components from one reliable source with one guarantee of satisfaction.

Get complete information on Allis-Chalmers Solids Handling Pumps from your nearest Allis-Chalmers Authorized Distributor or District Office. Or write Allis-Chalmers, Milwaukee 1, Wisconsin, asking for Bulletin 08B6381. A-3781

Allisite is an Allis-Chalmers trademark.

ALLIS-CHALMERS A-C

Big Savings

PEAK PRODUCTION

LONG LIFE OPERATION

LOW-COST MAINTENANCE

WITH

HENDRIX
DRAGLINE BUCKETS

When you find your material handling costs on the upgrade, CHECK YOUR BUCKET! If it isn't doing it's part, SWITCH TO A HENDRIX DRAGLINE BUCKET for low-cost, high-profit operation. They're engineered to take full bites, year after year, with trouble-free operation. Bumps, shock, stress and strain they take in their stride. For maintenance-free digging and MONEY IN YOUR POCKET . . . switch to HENDRIX!

⅜ to 40
CUBIC YARDS

A TYPE & SIZE
FOR EVERY
DIGGING PURPOSE

HENDRIX *Lightweight* **DRAGLINE BUCKETS**

Hendrix Buckets May Be Special Ordered Without Perforations

HENDRIX MANUFACTURING CO., INC.

MANSFIELD – LOUISIANA

ROUGH GOING!

ANOTHER JOB FOR REX® CHABELCO® PRECISION BUILT ALL-STEEL CHAINS

When you're looking for an elevator chain that will stand up under the toughest kind of going, you'll find the answer in Rex Chabelco. There's good reason why these all-steel elevator chains last longer . . . handle more tonnage per chain dollar. It's the *accurate pitch* that means smooth sprocket action . . . the precision-built, heat-treated parts pressed together to stay that make Rex Chabelco the leader for heavy-duty service.

Rex Chabelco Chains are engineered for your service by chain experts—men who have the experience of over 60 years to guide them in designing and manufacturing chains that will stand up in toughest conditions.

Yet these all-steel chains cost only slightly more than malleable iron chains. They are made to run over the same sprockets as malleable chains of corresponding pitch. Get more information on how they can make your bucket elevator dollars go further. Write to Chain Belt Company, 4604 W. Greenfield Avenue, Milwaukee 1, Wisconsin.

Other Rex equipment that's built to last

Rex Ley-Bushed Chains
For general elevator service under severe abrasive conditions.

Rex Combination Chains
For general elevator service where speeds and loads are moderate.

Rex Style "A" Bucket
For general service.

Rex Style "AA" Bucket
For heavier, more abrasive material.

For the ultimate in service, Rex Chabelco Chains should be run over Rex Temperim® Sprockets.

REX CHAIN BELT COMPANY

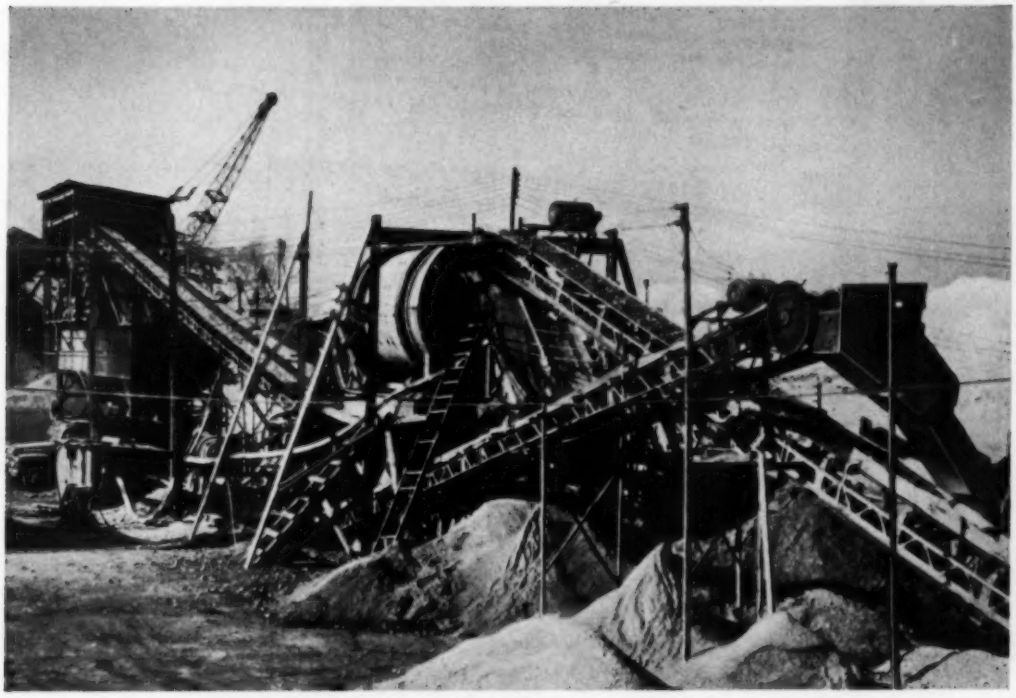
Chain Belt COMPANY OF MILWAUKEE

Atlanta • Baltimore • Birmingham • Boston • Buffalo • Chicago • Cincinnati Cleveland • Dallas • Denver • Detroit • El Paso • Houston • Indianapolis • Jacksonville • Kansas City • Los Angeles • Louisville • Midland, Texas • Milwaukee Minneapolis • New York • Philadelphia • Pittsburgh • Portland, Oregon • Springfield, Mass. • St. Louis • Salt Lake City • San Francisco • Seattle • Tulsa • Worcester

Distributors in principal cities in the United States and abroad.

"SINCLAIR LUBRICANTS CUT OUR MAINTENANCE COSTS!"

SAYS BUFFALO SAND & GRAVEL CO., SILVER HILL, MD.



Preventive maintenance and Sinclair Lubricants are credited with forestalling any major repairs on this Vibrator and Telsmith Superscrubber over 3½ years of continuous operation

Every year the Buffalo Sand & Gravel Co. processes and moves 350,000 to 400,000 tons of high-grade washed sand and gravel.

Says General Superintendent Don Carruth: "We've used Sinclair Lubricants 100 per cent for over three years.

"Sinclair SUPER TENOL® and TENOL® have helped us to reduce maintenance costs on our power units and on all the trucks in our large fleet.

"We've minimized repairs to transmissions and differentials since changing over to Sinclair Gear Lubricants.

"For lubrication of chassis, universal joints and many miscellaneous applications, Sinclair LITHOLINE® has reduced our inventory—and it's giving excellent results."

Why not learn how Sinclair Lubricants can help *you*? There is no obligation. Contact your nearest Sinclair Representative or write Sinclair Refining Company, 600 Fifth Avenue, New York 20, N. Y.

SINCLAIR LUBRICANTS

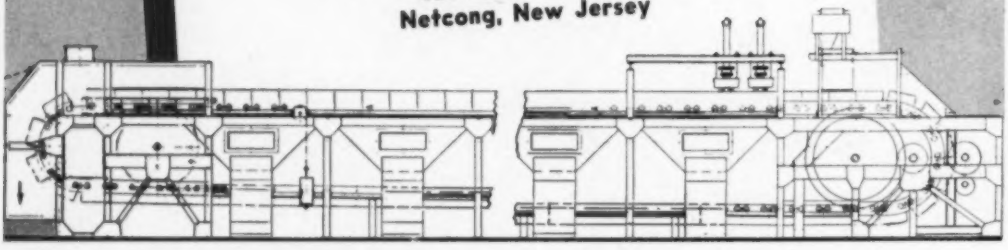
SINTERAGG®

Lightweight Aggregate

Of superior quality yet low in cost. Made on DWIGHT-LLOYD® Sintering Equipment from shales, clays, flyash and other suitable residues and waste materials.

Our laboratory is equipped to provide a ready answer as to the suitability of your materials for the manufacture of SINTERAGG.

Sintering Machinery Corporation
130 Sinter Avenue
Netcong, New Jersey



RUGGED A-C ENGINES Cost less

-to own

—because they are *mass produced* along with engines by the thousands for tough tractor service. Users benefit from these savings, as well as interchangeability of parts and other advantages of mass production.

There are further savings in getting *exactly* the power needed. Any power requirement can be filled economically with the four sizes of A-C Power Units—15 to 74 b. hp. They can be used singly or two or more together.

Ability to develop torque quickly makes A-C Power Units ideal for crushing and other sudden overload jobs.

-to use

A-C Power Units run inexpensively on gasoline, low-grade fuel, natural gas or butane. Their "tractor service" stamina keeps them on the job during critical work periods—avoids loss of valuable time due to shutdowns, helps build product acceptance and good will. Service facilities are nation-wide.

Get all the facts on rugged, high-torque A-C Engines for dependable, *low-cost* power. Our power engineers will gladly help select the correct unit for your needs.

ALLIS-CHALMERS
TRACTOR DIVISION — MILWAUKEE 1, U. S. A.

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BEMIS
Paper Shipping Sacks
MULTIWALL
BEMIS MULTIWALL

Don't pin us down to that, please. But, no fooling, the twelve Bemis multiwall plants, strategically located coast to coast, mean that at least one is conveniently close to you. This time-saving means money-saving. Ask your Bemis Man for details.

Bemis BAG COMPANY

General Offices—St. Louis 2, Mo.
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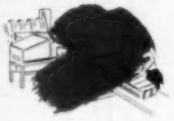
The preference for Hammond Multi-Wall Bags continues to grow steadily because of an ever-increasing list of satisfied customers in the cement, rock products and every industry where Multi-Wall Bags are used.

★ HIGHEST QUALITY PAPERS AND MATERIALS

★ PLANT EFFICIENCY



★ MODERN MACHINERY

★ PRIDE OF WORKMANSHIP

Write today for your copy of our booklet—
"To Serve You Better
with Hammond Multi-Wall Bags"

HAMMOND BAG & PAPER COMPANY

General Offices: Wellsburg, W.Va. Plants in Wellsburg, W.Va. and Pine Bluff, Ark.

Representatives in the following Cities:

Chicago, Ill. Minneapolis, Minn. New York, N. Y. Bluefield, Va. Columbus, Ohio
Charlotte, N. C. Ligonier, Pa. Houston, Texas Kansas City, Mo. Baltimore, Md.

BOGGED DOWN WITH HIGH HAULING COSTS?

LANDIS TRAILERS are your answer! Many revolutionary changes, including *smooth* surface bed that eliminates load-hanging, gives lower-cost operation. LANDIS owners have discovered that safe, positive connection to end, side or bottom dump trailers means added versatility — bigger, better jobs, but no more cost! LANDIS TRAILERS in your fleet get you "out from under" excessive costs!

Model illustrated: Side-dump, down-folding door. 8 cu. yd. capacity. Twin hydraulic hoists raise bed to dumping angle of 55 degrees. Bottom is ¼" plate, with liner of 2" of oak and ⅜" steel wear plate. This unit is designed for rough working conditions, such as mine or quarry duty.

LANDIS 12 yard on-or-off the road bottom Air-dump trailer, illustrated above: 20' 3" overall length. 7' height, 8' overall width. Door openings—2 doors 18½" x 8' 4", gravity opened, air closed from truck cab. Specially designed for fine materials. Sides and bottom—3/6" high tensile steel.

ON - OR - OFF THE ROAD

LANDIS TRAILERS

MEAN LOW COST HAULING!

Write or call today for information on the engineer-designed trailer for your hauling!

LANDIS STEEL CO.

Box 248 PICHER, OKLA. PHONE 734

October 1952

THE CONCRETE MANUFACTURER

A SPECIAL SECTION OF PIT & QUARRY

STEARNS 50..."really turns them out!"

PHONE 7129

PORT HURON BUILDING AND SUPPLY CO.
WHOLESALE AND RETAIL
3880 24TH STREET
PORT HURON, MICHIGAN

September 4, 1952

Stearns Manufacturing Company, Inc.
Adrian, Michigan

Gentlemen:

The concrete block business of my company has been growing by leaps and bounds since my purchase of a Stearns 50 which supplies without fail the great and increasing local demand for the best.

This company started 25 years ago, just handling coal. In 1937 the former owner purchased a small, hand-operated Stearns tamper. When I came out of the army in 1945 and bought the plant, I could see that the potential market for blocks in this vicinity far over-reached the capacity of an old-timer like that. In 1946 I bought a Stearns Joltcrete No. 7, but with the ever-increasing demand for good concrete block since the war, even this wonderful machine could not turn out enough.

So in January, 1951, I invested in a new, completely automatic Stearns 50 with even greater capacity. The 50 has proved to be just what I needed with its one-man operation, minimum down-time and its new vibrating principle that insures maximum production of highly compacted block with great load-bearing strength at less cost per unit.

Your parts service is good, too, and your field men certainly know what they are talking about. Let me say again that the Stearns 50 really turns them out!

Cordially yours,

Harold Lauth

Harold Lauth, Owner

Stearns 50 in Port Huron Building and Supply Co., Port Huron, Michigan, is operated by Henry Soulliere, block plant manager. "The 50 has proved to be just what I needed with its one-man operation, minimum down-time and its new vibrating principle that insures maximum production of highly compacted block with great load-bearing strength at less cost per unit," says the owner. Fully automatic. Simple, rugged mechanism. Heavy frame members for high stability. Power handling of plain pallets. 2-blocks-per-cycle. Dependable. Economical.

Ex-Sergeant Harold Lauth, left, who saw World War II service in Europe with a Third Cavalry tank outfit, at 26 became one of the youngest concrete block plant owners in the country on his purchase of Port Huron Building and Supply Co. in 1945. Right is Bill Swain, yard foreman.

STEARNS
MANUFACTURING COMPANY · INC
ADRIAN · MICHIGAN

OWERSHIP...
THE KEY TO SUCCESS!

STEARNS 15 STEARNS 30 ZIPPERS ADDITIONS SILVERS SKIP LOADERS TURNTABLES SINTERLITE

Meet your *extra* helpers in DURAPLASTIC*-made concrete products

I'm "Thrifty"
I help you cut production costs! How? By reducing the number of culls and throwbacks. Manufacturers using Duraplastic find there is less breakage in handling green products. Are you having too much breakage?
I'm "Nifty"
And I help put "sell" in your machine-made concrete products! Manufacturers report that clean, true edges and corners of Duraplastic-made products are a definite sales advantage. Face texture is richer, especially when harsh aggregates are used. Thus appearance of finished block is improved.

WE'RE EASY TO WORK WITH—With Duraplastic, you can make a more cohesive, rubbery mix which holds together better, feeds easily through machines. Excellent for concrete block, brick, pipe, drain tile and silo staves.

AND WE'RE ON THE JOB, RAIN OR SHINE—Users of Duraplastic-made products report increased resistance to passage of water through finished products: a good selling point for your products.

YET DURAPLASTIC COSTS NO MORE

It sells at the same price as regular cement and requires no unusual changes in procedure. Complies with ASTM and Federal Specifications. For descriptive booklet, write Universal Atlas Cement Company (United States Steel Corporation Subsidiary), 100 Park Avenue, New York 17, N. Y.

OFFICES: *Albany, Birmingham, Boston, Chicago, Dayton, Kansas City, Minneapolis, New York, Philadelphia, Pittsburgh, St. Louis, Waco.*

"Duraplastic" is the registered trade mark of the air-entraining portland cement manufactured by Universal Atlas Cement Company

ATLAS®

DURAPLASTIC

AIR-ENTRAINING PORTLAND CEMENT

PQ-D-146

Makes Superior Concrete Products at No Extra Cost

"THE THEATRE GUILD ON THE AIR"—*Sponsored by U. S. Steel Subsidiaries—Sunday Evenings—NBC Network*

The CONCRETE MANUFACTURER October 1952

Election Mathematics

THIS magazine, in common with almost all branches of the technical press, does not make it a practice to endorse either political parties or individual candidates. Subscribers who have read this page in recent months may have sensed that we were leaning strongly in a particular direction, but the truth of the matter is that we're just about as much up in the air as the next fellow.

When all the razzle-dazzle of a political campaign is past, it seems to us that the most important single issue is *not* how or for whom we vote, but rather that we do vote. Wholly apart from its practical function, the secret ballot still provides a unique opportunity for every citizen to express a renewal of his faith in our system of government. If this is a fair observation, what conclusion must we draw from the persistent failure of millions of Americans to appear at the polls on election day? Were the more than 40,000,000 eligible voters who failed to vote in the 1948 presidential election giving expression to their *lack* of faith in representative government?

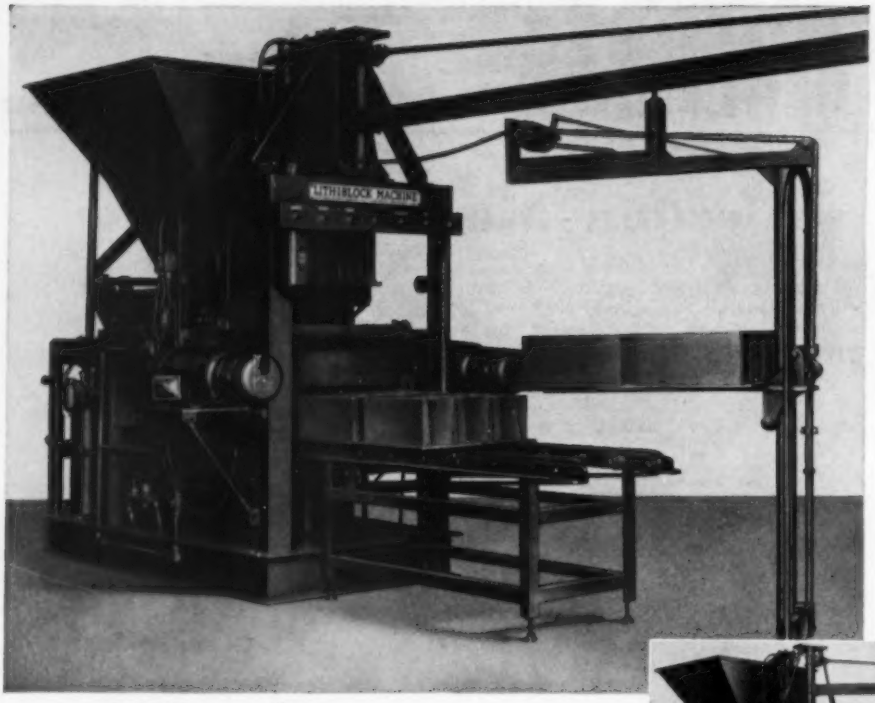
No matter how the phenomenon is explained, the facts are clear and the implications are ominous. Only 52 percent of our voting population cared enough about the issues involved in the last presidential election to cast ballots. When the presidency is not at stake, our performance is even poorer, for only about 20 percent of the eligible voters take the trouble to vote in off-year elections. This means, for all practical purposes, that four out of five citizens have in effect disenfranchised themselves by allowing 20 percent of the voters to resolve issues which affect all voters.

What about the 20 per cent who *do* vote? Are they carefully screened and selected in accordance with some reasonably rigid standard which affords assurance that they will wisely exercise the prerogatives of the 80 percent who stay home? Obviously they are not. As a group they fall into either of the following categories: citizens who regard it as a solemn duty, as well as an exalted privilege, to vote for the kind of government which they believe will be best for America; and citizens whose more immediate concern is to assure the re-election of the party in power as a means of retaining their own positions on the payroll of the Federal Government.

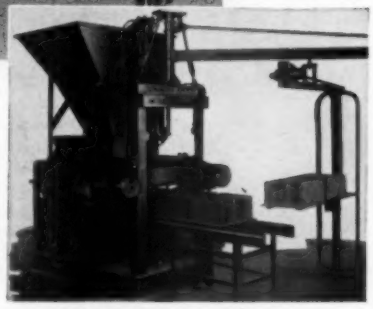
It should go without saying that there are undoubtedly some men and women on the Federal payroll today who will vote in accordance with their honest convictions. But having regard for the hard, practical facts of politics, it is inevitable that the vast majority will be voting for the continuity of their jobs. That amounts to a lot of votes. There are at present about 2,600,000 civilian employees on the Federal payroll. Assuming with the utmost restraint that each job represents 2½ votes, it would appear that the party in power can count on close to 6,500,000 sure votes, which will be cast without any regard to the issues of the moment. The effect would be much the same if we passed legislation permitting the political "ins" to throw out 6,500,000 legally cast ballots selected at random, and substitute for them an equal number of ballots machine stamped for the incumbent party.

There have been a few times in history when the plurality of the winning party amounted to more than 6,500,000 votes, but most elections have been won by much narrower margins. A little over a million votes settled the election of 1948, and there are strong indications that the 1952 contest will also be a neck-and-neck affair. The captive votes would be a factor of tremendous importance even if all Americans turned out on election day; if 40,000,000 of us stay home again, it seems hardly worth while to bother counting the ballots.

William M. Avery



MODEL L-5
720 Block per hour. Three Block per cycle.



MODEL L-3
480 Block per hour. Two block per cycle.

IN A CLASS BY ITSELF

Per dollar invested, you'll get more money back from this machine, — and get it back faster — than from any other block machine. It is the most efficient block producer in the business — everything about it is engineered to save time, cut costs, conserve your capital, and reduce labor. It is the workingest machine you ever saw; a maintenance man's dream. Fast as greased lightning, — and the precision products it turns out have a quality that makes sales soar. It is the machine to grow with, to stay on top with. We'll give you the mechanical details — the feature story — without obligation or pressure. Then get around and ask the users of this machine — let them tell you why their Lith-I-Block Machines are the smartest investment they've ever made. Write us today.

In actual operation, both machines produce well beyond rated volume. Note the elimination of all heavy, costly cams and gears; the steel skyscraper construction that permits quick cleaning; immediate accessibility of all parts. No special foundation required — less than 40 square feet of floor space. Progressive operating stages are completely automatic, air-hydraulic manipulated. Plain pallets, with built-in pallet oiler. Mold boxes (for unlimited variety) changed in a jiffy. Direct factory service. Write for full details.

LITH-I-BLOCK

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news of the concrete industries

Empire State S., G. and R. M. C. Assn. Directors Meet at Niagara Falls

On Aug. 27 the Directors of the Empire State Sand, Gravel and Ready Mix Association met at the General Brock Hotel, Niagara Falls, Ontario, for an important three-hour session. Plans for future meetings of the association were among the items considered.

In order to bring the many questions of sand and gravel producers before the Association for appropriate consideration, the group decided to schedule a Sand and Gravel Panel at the coming October meeting of the Association. Participants in the panel will be members of the Association, and an opportunity will be accorded everyone for a full discussion. The October meeting, which is tentatively scheduled for Oct. 15 and is expected to be held in the Hudson Valley area in the vicinity of Poughkeepsie, will also feature discussions on cement and concrete under the sponsorship of the Portland Cement Association.

The directors also discussed the possibility of having a "Short Course School" two or three days long at the January Winter Meeting. It was reported that Dean of Engineering, S. C. Hollister of Cornell University, expressed extreme interest in making facilities of Cornell's engineering department available for such a session. The course subjects would be determined by the program committee; Dr. Hollister and his associates would partake in the program. Information is now being gathered to determine the feasibility of such a school.

Executive secretary, Paul R. Smith, reported on his recent trip through New York. He told of numerous suggestions offered by persons interested in the activities of the Association. During this report Mr. Smith pointed out aims of the Association were to promote programs designed for industries to supply quality products, to lend assistance in broadening the market for sand, gravel, and ready mix concrete, and to keep members informed on subjects of common concern, such as Government regulations, business trends, and the like.

An evening dinner meeting, sponsored by the Western New York Area members of the Association, was held at the General Brock Hotel with Vincent P. Ahearn, secretary of the National Association, as guest speaker. There were 45 in attendance, including George P. Robertson of Standard Paving and Materials, Toronto, and Stafford Smythe, of C. Smythe, Ltd., also of Toronto, as guests of Harris N. Snyder, past president of National Sand and Gravel Association.

Southeastern N.C.M.A. Meeting To Be Held at Miami Beach

According to information received from George W. Katerjohn, the program of the ninth annual Southeastern Regional Meeting of the National Concrete Masonry Association has been worked out, and members soon will be receiving a printed schedule.

Sessions will be held on November 24 and 25 at the Hotel Sherry Frontenac, Miami Beach, Fla. Meetings will be open to all concrete block and products manufacturers, especially those in the Southeast.

Coming Events

November 5-7, 1952—Miami. Fall meeting, Southeastern Concrete Pipe Association.

November 20-22, 1952—Chicago. Second annual Short Course, American Concrete Pipe Association. Sherman Hotel.

November 24 and 25, 1952—Miami Beach. Ninth annual Southeastern Regional Meeting, National Concrete Masonry Association. Hotel Sherry Frontenac.

January 25-29, 1953 — Cleveland. 33rd annual convention and exhibit, National Concrete Masonry Association, Public Auditorium.

February 2 and 3, 1953—Toronto, Canada. Fourth annual convention, National Concrete Products Association (Canada). King Edward Hotel.

February 23-26, 1953—San Francisco. 23rd annual convention, National Ready Mixed Concrete Association. Hotel Fairmont.

Harvey Whipple, Retired Veteran A.C.I. Official, Dies in Michigan

Harvey Whipple, who for 32 years guided the affairs of the American Concrete Institute as secretary and later as secretary-treasurer, died September 6, 1952, at his home in Northville, Michigan.

Mr. Whipple had served a number of years on Detroit newspapers and was managing editor of *Concrete-Cement Age* when he became part-time secretary of A.C.I. in November, 1919, when Institute membership was 232. Mr. Whipple's intense interest in Institute affairs soon induced him to devote full time to them and through his continued efforts, membership was in excess of 5,800 at the time of his death. In 1921 he assumed the responsibilities of Institute treasurer and filled the dual role until this year when he was named editorial consultant upon his retirement July 1.

Mr. Whipple inaugurated the A.C.I. *News Letter* in 1920, which became part of the Journal of the American Concrete Institute when that technical periodical was begun under his guidance in 1929. He was also author of the book, *Concrete Stone Manufacture*, published first in 1915 and revised in 1918.

Billy Whiskers Is Penalty For Mishaps at Fisher Plant

Safety has a lively, visible symbol around the plant of the Fisher Lime & Cement Company at Memphis, Tenn. It takes the form of a goat whose keepers change each time a department has a lost-time accident.

One group not likely to be candidates for the dubious privilege of caring for the bearded quadruped for a while is the Hollywood ready-mix department, for the 52 safety-minded truck drivers recently completed a full year (126,960 man-hours) of work without a lost-time accident. James E. Bagwell is manager of the ready-mix department, and Charles E. Nichols is Fisher's safety director.

According to an announcement received from A. W. Devos, secretary of the Wisconsin Concrete Products Association, the 33rd annual convention of that organization will be held at the Plankinton Hotel, Milwaukee, on January 14 and 15, 1953.

Chicago P.C.A. Appoints Carl A. Menzel and S. H. Westby to New Posts

Carl A. Menzel, former manager of the Housing and Cement Products Bureau, Portland Cement Association, Chicago, has been appointed Consultant on Concrete Technical Problems effective September 15, 1952, according to an announcement by Carl D. Franks, the Association's executive vice president. Succeeding Mr. Menzel as manager of the Housing and Cement Products Bureau is S. H. Westby, assistant manager of the Bureau since 1945.

Carl A. Menzel

Mr. Menzel is well known to the engineering profession for his extensive research and development work on building materials and construction techniques. He is also a nationally recognized authority on fire resistance.

In 1951, Mr. Menzel won the annual Award of the Concrete Reinforcing Steel Institute for his contribution to the development of an improved type of deformed bar for use in reinforced concrete. He has also received the Dudley Medal of the American Society for Testing Materials and the Wason Medal of the American Concrete Institute for outstanding development work in the concrete field.

A graduate of the University of Illinois, Mr. Menzel received a degree in Mechanical Engineering in 1917. He joined the Association staff in 1928 as an associate research engineer. He has been manager of the Housing and Cement Products Bureau since 1947.

Mr. Westby joined the Association staff in 1943 and was appointed assistant manager of the Housing and Cement Products Bureau two years later. Before joining the P.C.A., he was associated with Consoer, Older & Quinlan, consulting municipal engineers in Chicago; H. M. Byllesby Engineering & Management Corp., Chicago; the Illinois State Highway Department; and the Columbia Steel Co., Chicago, in design and construction work.

S. H. Westby

A civil engineering graduate of the University of Illinois, Mr. Westby is also a registered professional engineer in Illinois.

R.M.C. and Products Plants Opened in South, Midwest

New ready-mix and concrete products plants are reported from many sections throughout the country. Here are a few:

The second ready-mixed concrete plant of MacDougald-Warren, Inc., recently went into operation near Atlanta, Ga., serving sections northwest of the city.

At Mission, Tex., the Havana Materials Company, headed by H. M. Bodine, has gone into business to produce ready-mixed concrete with a crew of 20 men.

One of the newest industries of Nashville, Ark., is the Howard County Block Company, owned and operated by J. R. Chambers. The three new block machines can turn out 1,000 units each per day.

In another Arkansas community, McGhee, the Blankenship Ready-Mix Concrete Plant, first of its kind in the southeast section of the state, has gone into operation. Rollie Blankenship, owner, states that he will also produce block and drain tile in the near future.

Criss Concrete, Inc., a new business venture of Mr. and Mrs. R. D. Criss and Mr. and Mrs. J. Lundblade at Towanda, Kans., began producing transit-mix concrete last summer. The plant is equipped with the most modern equipment and has two storage silos each with a capacity of 10 carloads of materials.

The Basalt Rock Company has recently been granted a permit by the Sonoma County Board of Supervisors for constructing a $25,500 ready-mix concrete plant at El Verano, Calif. In granting the permit, the board specified that the property must be fenced and adequately landscaped.

N.S.G.A.-N.R.M.C.A. Short Course to Be Given November 17-21

The seventh Annual Short Course for technicians of the sand and gravel and concrete industries will be held at the University of Maryland from November 17 through November 21. As in past years the Short Course will be sponsored by the National Sand and Gravel Association and the National Ready Mixed Concrete Association.

Lectures and demonstrations will comprise the course, with students divided into three groups, according to background and interest. In group A the emphasis will be on laboratory practice with basic instruction in elementary concrete mixture design and calculation of yield.

Classroom work in concrete mixture design and allied subjects will be stressed in group B sessions

In group C laboratory and classroom instruction will be combined. This section will be considered intermediate between group A and group B. The subjects covered will be substantially the same as those offered last year, but a considerable amount of new material will be added.

Second A.C.P.A. Short Course Scheduled in Chicago Nov. 20

According to an announcement released by Howard F. Peckworth, managing director, American Concrete Pipe Association, the second annual Short Course of instruction sponsored by A.C.P.A. will be held in Chicago from November 20 through 22.

Sessions and headquarters will be at the Sherman Hotel.

The Southeastern Concrete Pipe Association will hold its annual fall meeting at Miami, Fla., on November 5, 6, and 7.

Universal Concrete Pipe Company Awarded "Joshua"

Universal Concrete Pipe Company of Columbus, Ohio, has been awarded a "Joshua," symbolizing first prize for the most distinguished use of match book advertising by a building equipment and materials producer during the last year. The Universal match book received top award on the basis of ingenious use of a circular shape match cover to describe the company's products.

Among the six companies receiving honorable mention certificates in the building products classification was Rock Island Sand and Gravel Co., Portland, Ore.

● Correction

We regret that the Vermiculite Association, 64-67 83rd Place, Rego Park, L. I., New York, was unintentionally omitted from the list of national associations published with the Concrete Manufacturer 1953 Buyers' Guide in our August issue (page 171). The association was formed in 1950 under the laws of the state of New York. William S. Elliott is secretary-treasurer, and William S. Steele is chairman.

Single Machine Makes 700 Squares Of Roof Tile Daily at Tampa Plant

By WILLIAM M. AVERY

another ON THE SPOT report

ABOUT a year ago Cement Roofing Industries, Inc., of Tampa, Fla., went into production with the first Besser-Anza concrete roof tile machine manufactured in the United States. Developed in New Zealand more than a decade ago, and widely used in that country as well as in Australia, the machine utilizes an entirely new principle in forming tile at the astonishing rate of 24 units per minute.

The Tampa concern had produced concrete roof tile for a number of years and had developed a large market for its output in St. Petersburg and other growing Florida West Coast communities. One of the company's most serious problems was to find a means of increasing tile output in proportion to the soaring demand without moving to a larger plant site, and at the same time to accomplish this purpose without aggravating an already critical manpower problem. The high production Besser-Anza machine seemed made to order to achieve these objectives.

The facilities are housed in a new 100-ft. long concrete masonry building at the rear of the company's property. Raw material storage, mixing, and handling facilities, the intricate machines used in forming and spray-painting the tile, and the curing areas are all located under the same roof. Materials used include portland cement, coarse sand obtained from Oak Ridge, Fla., slag which is a by-product of material made by the Victor Slag Company of Tarpon Springs, and very fine sand from a deposit within 10 miles of Tampa. All of these materials come in by rail and are unloaded from a siding at the end of the building. Bagged cement, which is received in box cars, is stored in the warehouse section of the building adjacent to the mixing area, while the bulk materials are hand-shoveled from the cars into storage compartments at the open end of the building.

Aggregates are shoveled into a tripper-type, volume-proportioning box which operates on an overhead mono-rail as a means of transporting the materials to the mixer. Since waterproofing of the tile is achieved mainly through blending of the materials, considerable care is exercised in proportioning, to assure the output of very dense low-absorption concrete. All aggregates pass the ¼-in. screen, and semi-dry mixes are used.

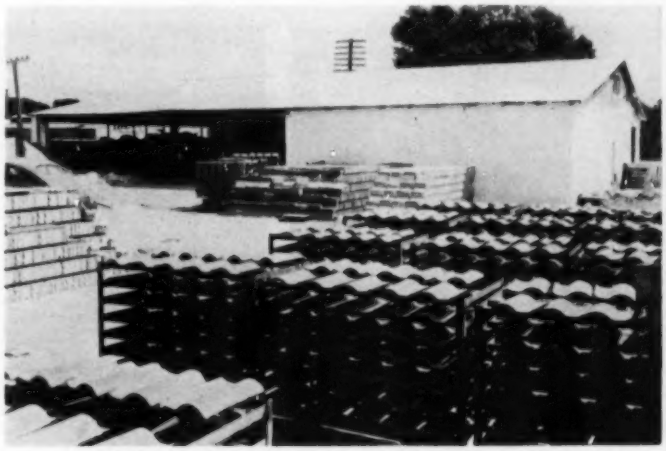
The 12-cu. ft. Besser batch mixer is located in a shallow pit between the storage area and the machine proper. A short inclined drag conveyor elevates and discharges the mixed materials into a small supply hopper located above the forming head of the machine.

Cured tile produced the day before are stripped from their pressed-steel pallets at the feed end of the machine, so that the pallets may be re-used immediately without rehandling. The bond between tile and pallet is broken with an air chisel to facilitate stripping, and the pallets are normally re-used without cleaning or brushing. Pallets are placed one at a time on a chain conveyor which automatically spaces them at the proper intervals and feeds them to the forming machine. Just before entering the machine the pallets are sprayed automatically with a special oil mist which is an important factor in obviating the need for mechanical cleaning after each use.

The manufacturing head of the machine utilizes a new principle in forming tile, for the concrete is "knitted" onto the pressed-steel in sections rather than rolled. Called a "knitting roller" by the New Zealand developers, the head is grooved to form the deep run-off channels and side lap which are features of the unit, but the actual compacting of the concrete is achieved by means of an oscillating motion combined with slow turning. An adjustable mechanical shovel feeds concrete to the roller at the required height and rate, so that units of constant density can be produced despite minor variations in the mix itself.

The tile, supported on closely-spaced individual steel pallets, leaves the forming head in a continuous ribbon, the top (exposed) face being smoothed by means of two finishing rollers which float on the surface of the material. As the ribbon progresses through the machine, the units are sheared apart, and the excess material between adjacent pallets is automatically formed into the so-called "headcheck" which closes off the back or top of each tile.

As soon as the head check is formed, pallet and tile are picked up by mechanical fingers and placed on a transverse chain conveyor operating at right angles with the forming machine. By placing the long axis of the tile across the conveyor, the 90-deg. turn provides an opportunity to trim and finish the ends of the units, this job being done by rotary devices located on both sides

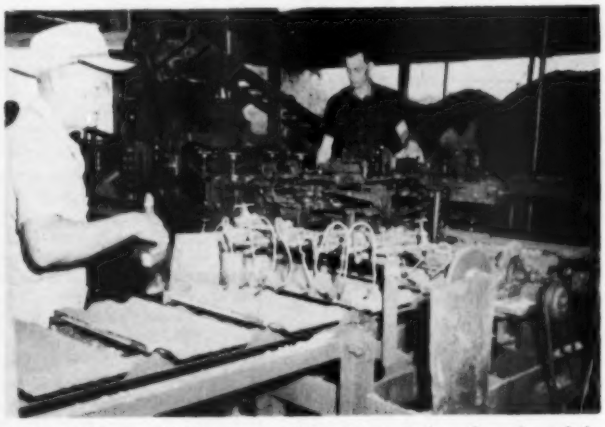


• A view taken from the storage yard of the new high-production plant of Cement Roofing Industries at Tampa, Fla.

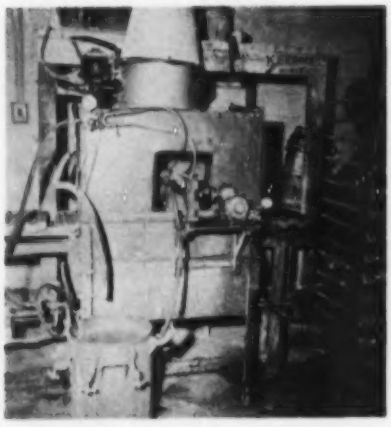
• The ribbon of concrete emerging from forming rolls can be seen in this picture looking down on the machine. Completely formed tile are visible on the transverse conveyor (right).

• Aggregates (coarse sand, slag, and fine sand) are hand-shoveled into this tripper-type volume batching box.

• Using an air chisel to break the bond between hardened tile and pressed steel pallet—the first, and last, step in the manufacture of the tile.



• Air jets (foreground) blow loose particles of concrete from the surface of the units as they move along the conveyor. Rotary devices (right) trim and finish the end of the tile.



• Paint spray booth, where units are coated with a mixture of portland cement and mineral oxide colors.

• Lift truck operator prepares to remove a freshly-loaded rack of tile from one of the turn tables adjacent to the runout conveyor.

●Spanish mission-type tile and flat interlocking tile are produced on other machines in a separate plant building.

of the conveyor. Multiple air jets also serve to blow off any loose material from the surface of the units.

Color may be imparted at the mixer or by spray painting in a booth which encloses a short section of the run-out conveyor. At the Tampa plant, where units are produced in six different colors, only red is obtained by integral addition at the mixer. Other colors are prepared by grinding together portland cement and mineral oxides to form a slurry which is automatically sprayed on the surface of the tile as it passes through the paint booth. The actual spraying is done by a special oscillating cement gun which is suspended above the conveyor.

Beyond the spray booth the tile are removed from the conveyor by hand and placed in curing racks consisting of horizontal rods projecting both ways from a central steel framework. The racks, each of which holds 192 units, are placed on turntables besides the runout conveyor so that when one side is fully loaded they may be quickly rotated to bring the empty side adjacent to the conveyor. Loaded racks are picked up by means of a Truck-Man lift truck and transported to the curing area, which comprises almost half the space in the building.

The freshly-molded units remain in the building overnight. The following morning the racks are transported one by one to the head end of the production line, where the stripping is done and the pallets are re-fed in the manner described above. Turn tables are also used at this point to facilitate the unloading of the racks. The tile are loaded onto platform trucks, which are hauled to the storage yard by means of a tractor.

The tile produced by the Besser-Anza Machine at Tampa is a French-type interlocking unit which measures 10 by 16¾ in. They lay up 120 units per square in the roof. Weight per unit varies from 7½ to 8 lb., or from 9 to about 10 lb. per sq. ft. of finished roof. In a 1:4 mix with a yield of 55 to 60 tile per bag of cement, average breaking strength is said to run from 350 to 400 lb. when the units are supported on 10 in. centers, whereas most building codes call for about 200 lb.

Where there is sufficient demand to justify the change-over, the Besser-Anza machine is adaptable to the manufacture of other types of tile. The Tampa concern produces and sells flat-interlocking and Spanish mission-type roof tile, but these units are currently manufactured on Duntex machines located in a separate building. The company has ordered a second Besser-Anza machine which, when delivered and set up, will be used entirely to supplement the present output of Spanish-type roof tile.

The company operates its own fleet of delivery trucks and is set up to deliver and install up to 100 squares of concrete roof tile per day. All the Duntex output and a portion of the Besser-Anza units are two-coat spray painted on the job.

Operating at its rated speed of 24 units per minute, the Besser-Anza machine is turning out about 70 squares of roof per day with a 10-man crew. Oscar Poller, vice-president of the company, says he is well pleased with the performance of the machine, and reports that the French-type unit, which had been relatively unknown in the Tampa area, has already gained wide acceptance.

Design-Construction Revision Issued by Chief of Engineers

According to word from National Concrete Masonry Association headquarters, the Office of the Chief of Engineers has issued its latest revision of *Design and Construction Procedures for Permanent Construction Utilizing Concrete Masonry Units*, the first edition of which was released in March, 1951.

The principal changes incorporated in the present edition are as follows:

The American Standard Building Code Requirements for Masonry has been adopted as the basis of design for masonry construction.

The top 8-in. course of concrete block foundation walls is to be a re-inforced bond beam.

The requirements as to joint re-inforcement are defined more specifically.

Concerning control joints, preference is to be given to joint details which provide for load transfer across the joint in shear.

A new paragraph on dimensional coordination in design should effect an optimum use of standard-size masonry units with resulting economies in construction.

A new paragraph requires square-end units where these abut concrete columns.

Roselips to Build New Plant At Luis Obispo, Calif.

Watler Roselip and Sons are erecting a new $30,000 concrete batching plant at San Luis Obispo, Calif., as a result of a contract for construction work in connection with a subdivision development in that city.

The firm will provide all the needed concrete, street base material, and asphaltic surfacing material for the project. Also included in the contract are approximately 10,000 lineal ft. of curb and gutter construction, as well as culvert requirements. Concrete needed for foundations of homes will be in excess of 10,000 cu. yd., which represents an estimated value of $250,000.

Swiss Materials Concern Features Sand Lime Bricks

A handsomely turned out publication of Hunziker and Co., Ltd., Zurich, Switzerland, (issue of May, 1952) covers one major line of this firm—sand lime bricks. The 98-page journal deals with the manufacture of sand lime bricks and contains many examples of the application of these units in private homes, apartments, institutions, and industrial and pubic buildings.

Schematic drawings, sketches, sectional views, and photographs illustrate the many phases of the industry covered in this publication. Exceptionally fine photographic reproductions of buildings constructed from sand lime brick are included, some in color. Other shots show construction details and procedures. Hunziker plants are operated in six cities of Switzerland.

Branch Office Expands to Plant Status When Block Sales Boom at Abilene

another ON THE SPOT report

ABOUT 3½ years ago the Texas Concrete Block Company of Lubbock established a branch sales office at Abilene to handle the increasing volume of orders originating in that city. The venture proved so successful that within a year and

By WILLIAM M. AVERY

a half the company's delivery trucks were burning up the highway between Lubbock and Abilene.

Although nobody in Texas would dream of admitting that a 165-mile one-way haul is a bit on the excessive side, the establishment of separate manufacturing facilities at Abilene, which is a center of oil activity in west Texas, made good sense from every conceivable point of view. The new plant, which went into production exactly two years ago this month, was operated for a time under the name Conotex Company, derived by telescoping the words "Concrete of Texas", but subsequently it was decided to operate both plants under the name adopted at Lubbock.

The entire output of the Abilene plant consists of lightweight masonry units which weigh approximately 26 lb. in the standard 8-in modular size and which show the surprisingly high average 28-day compressive strength of 1650 p.s.i. The material used is called Featherlite, an ex-

• John Barton, manager of the Texas Concrete Block Company's plant at Abilene.

panded shale aggregate produced in rotary kilns located at Strawn, Texas, and shipped by rail to the block plant in Abilene. An exceptionally well graded material as manufactured, it ranges from ⅜ to ¼ in. in the coarse fraction, and ¼ in. down to dust in the fine size.

The general layout of the plant is conventional in most respects. A sizable machine room is flanked on one side by the rail siding and on the other by the curing kilns, which open onto a 24-ft. wide aisle, the latter also providing access to the cubing area and the storage yard. Batching and mixing are done on a balcony which runs the full width of the building over the machine floor. Although only one block machine is now in operation, the design was based on two machines, and when this expansion is carried out, a weigh larry will be used to serve the additional mixer required.

Separate undertrack hoppers and totally enclosed bucket elevators provide for receiving and elevating aggregates and bulk portland cement. Each compartment of the 4-compartment overhead steel bin provides for the storage of about 67 cu. yd. of material, one pocket being used as a supply hopper for cement. Flow into the three aggregate compartments is controlled by means of a turnhead located above the bin, while a flop gate at the top of the cement elevator determines whether this unit discharges into a 2-car steel silo or into the supply hopper. An 8- by 12-ft. triple-deck vibrating screen mounted over the aggregate compartments provides for regrading incoming materials as desired.

Cement and aggregates are weighed with Fairbanks-Morse scales, and the water is carefully metered to control the consistency of the mix. No admixtures are employed, but plasticity is obtained by using air-entraining cement for all mixes.

Mixing is done with a Besser 50-cu. ft. batch mixer, and the units are molded with a late model plain-pallet Super Vibrapac machine of the same make. In a 9-hr. work day production averages approximately 7,800 8- by 8- by 16-in. units or equivalent. One somewhat unusual installation detail is the inclusion of a bucket elevator near the block machine for returning spilled concrete to the mixer.

The blocks are loaded two pallets at a time into 72-unit steel racks, which are picked up by a Hyster Salsbury turret-type platform lift truck and transported to the curing rooms. There are five kilns, each measuring 14 by 76 ft. and accommodating 24 racks for a total capacity of about 8,600 units. The green units are allowed to preset for approximately an hour, and then steam is admitted and the temperature is gradually and uniformly brought up to the maximum of about 170 deg. F. This level is maintained by means of hand control for a period of 7 hours before the steam is cut off. After a soaking period of

• A general view of the Texas Concrete Block Company's modern block plant at Abilene. The building under construction at the left is a warehouse for paint, window sash, and other items related to concrete masonry.

at least an hour the doors are opened and the kilns are unloaded. Steam for curing is supplied by a 150-hp. gas-fired automatic boiler.

All production is assembled into cubes for convenience in subsequent handling, storing, and loading operations. The cubes are formed by hand in a special paved area adjacent to the curing room, then picked up, transported, and placed in 3-high storage piles by means of Hyster fork lift trucks equipped with side shifters. Standard 8-in. units are formed into cubes containing 90 blocks. Fractional units and specials, all of which are placed on a single tier of 8-in. blocks which serve as pallets, make up into cubes of approximately the same size.

The Abilene plant is located on an excellent 6½-acre industrial site on the outskirts of the city. At the time the accompanying photographs were taken about half the area had been paved, and we are advised that considerable additional paving has been completed since our visit.

The company reports excellent general acceptance of masonry construction in the Abilene area, and attributes this in large measure to its own introduction of lightweight haydite units several years ago. The product is used almost exclusively in school construction, and has become an increasingly important factor in the construction of oil field supply houses, warehouses, and residences.

Windows, paint, and other materials closely related to concrete masonry also are sold at the Abilene plant. A sizable warehouse adjoins the attractive plant office building for storing such related materials. Two company-owned flat-bed trucks are in constant use for making deliveries, and in addition three individual contract-haulers are kept busy most of the time. Many deliveries are made to points 100 miles from Abilene.

The company has its own radio program, and in addition makes extensive use of both newspaper and billboard advertising. Owners of the parent organization, all of whom are located at Lubbock, are three brothers, Robert, Edward, and N. A. Brown. John Barton is manager of the Abilene branch. This year the company opened a third plant in the city of Midland, Texas, which is also in the midst of a tremendous oil boom.

• A turret-type platform lift truck is used for handling racks.

• Production on this high-speed plain-pallet machine averages about 7,800 units per 9-hour day.

• This attractive office building of exposed concrete masonry units has proved to be a fine aid in selling. The photograph was taken before the present company name was adopted.

Tucson Building Boom Forces Expansion of Columbia Block

ON THE SPOT

A LUSTY building boom has engulfed the erstwhile winter-resort city of Tucson, Ariz., due to an influx of industrial and defense installations. Concrete blocks—all building materials, in fact—are in great demand. Makers of concrete masonry units have a difficult time of it keeping purchasers from loading up in the yard before the blocks have cured sufficiently to develop even the minimum strengths! So production and curing facilities are being expanded as rapidly as possible to supply the needs of the moment and of the future.

Typical of the growth of the concrete products industry in the Tucson area is the plant of the Columbia Block Company, operated by Carl Shurtz. Just two years ago this plant was erected and went into production with one Columbia automatic machine. A year later, in the spring of 1951, a second Columbia machine was added. Again, in February of 1952, still a third Columbia unit was placed in service.

Until now, all the block has been sprinkled and yard-cured only, but new steam-curing kilns are being erected, scheduled to be put to use upon completion. These curing rooms, four in number and capable of handling 25,000 standard (for Arizona) 4- by 8- by 12-in. units, are of concrete-masonry construction, with Flexicore concrete slab roof members. Glass block panels have been used in the closed ends to transmit natural light. Steam is to be supplied by a Francis 37½-hp. triple-unit gas-fired automatic generator. This modern method of steam generation allows the greatest flexibility possible in controlling moist or relatively dry heat as desired, and is highly economical, both in first cost and in operation, as compared with a regular steam boiler. The generator uses fuel only when steam is required and employment of a steam engineer is not necessary.

The entire production installation at the plant was furnished by the Columbia Machine Works, Vancouver, Wash. In addition to the three block machines, which are supplied with concrete by chutes from a common concrete hopper overhead and with ground-level control gates on the chutes, equipment includes bulk-cement weigh-batching units, a 50-cu. ft. Columbia batch-type mixer, and a 2-cu. yd. bucket hoist which raises the concrete from the mixer to the elevated hopper over the machines.

Aggregates are purchased and transported from a truck hopper below ground level to the batch-plant bins by a belt-conveyor. Gasoline-powered Hyster 40 fork-lift trucks handle the loaded and empty racks and return the pallets to the automatic-feed receptacles at the rear ends of the machines.

• Below: The 37½-hp. triple-boiler generator which will supply steam for the new curing rooms.

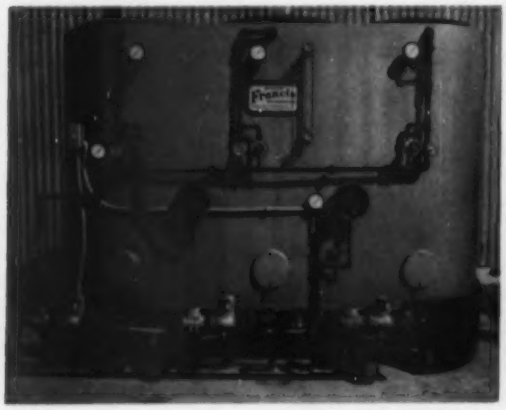
Bartlett Named President Of Milwaukee C.M. Industries

Newly-elected president of the Concrete Masonry Industries of Milwaukee is Edwin B. Bartlett Jr., Best Block Company. At the same time Bruno Garni of the Advance Cast Stone Company was named vice-president, and Otto Ladwig Jr., of Otto Ladwig & Sons, Inc., secretary-treasurer.

The organization also passed a resolution (to be put into effect on December 1) to reduce the height of concrete blocks from 8 inches to the modular system standard of 7¾ inches.

• Right: At the Columbia Block Company's plant, Tucson, Ariz., racks are placed conveniently for the off-bearers around the three block machines. Three chutes from the overhead hopper keep the machines supplied with concrete.

• Below: The 37½-hp. triple-boiler generator which will supply steam for the new curing rooms.



Richmond Products Firm Makes Quality Glazed Masonry Units

By FRANK G. LOUTHAN, JR.

THE Concrete Pipe and Products Company of Richmond, Virginia, is manufacturing glazed concrete masonry units on a production-line basis. The units are made in two distinctive types: tile face (Type B) and textural face (Type A). The end product has all of the desirable features of concrete masonry units and the added appeal of color-fast interior surfaces which are attractive, easily cleaned and require little or no maintenance. The manufacturing process was developed by the Burns & Russell Co. of Baltimore, Md., and is licensed to concrete products firms throughout the country. Sold under the name Spectra-Glaze*, the block makes it possible to build and finish in one operation, eliminating the costly and time consuming work of lathing, plastering and painting, or the veneering of a loadbearing masonry wall with a masonry furring unit.

The tile face unit has a uniformly smooth face with a satin finish, while the textural face unit retains in high gloss finish the natural texture of the base block. Both types are regularly produced in seven different colors. Special colors or shades can be supplied on special order.

The plant of the Concrete Pipe and Products Co. is located on the Belt Boulevard just south of the Petersburg Pike in Richmond. The officers of the company are Stanley R. Navas, president; Harry W. Easterly, Jr., executive vice president, and Henry C. Hofheimer, II, secretary-treasurer. Frank G. Louthan, Jr. is general manager of the Spectra-Glaze Division.

The equipment for manufacturing glazed concrete masonry units is set up along two parallel production lines running in opposite directions. Thus the starting point and discharge point of the assembly lines are adjacent, permitting a rapid reuse of molds used in the process. The first leg of the production line consists of a preheat booth, a spray booth, and loading and mixing equipment mounted along a 70-ft. variable speed conveyor. The second leg consists of a 75-ft. continuous oven with variable temperature and speed controls. The oven, manufactured by the J. O. Ross Engineering Co., is a forced-circulation, hot-air unit that is fired with No. 2 fuel oil.

In the production of tile face units, stainless steel molds, measuring 7¾ by 15¾ by ½ in., are placed on the first conveyor in continuous line. After by-passing the preheat and spray booth, the molds are loaded with slurry from an oscillat-

*Trade mark property of Burns & Russell Co.

• Scene at the plant of the Concrete Pipe and Products Company, Richmond, Va., showing workers stripping and inspecting finished glazed units.

• At this stage a worker places the pallets on the conveyor for re-use in the machine.

• Here the block is being placed on the conveyor at the feed end of the oven.

ing extruder backed up by a continuous mixing arrangement. From the load conveyor the pans or molds are transferred to the oven conveyor and the concrete masonry units placed on top of the slurry inside the edges of the molds. The slurry penetrates every void in the face of the block and when hardened forms an inseparable bond between the two materials. The specials or shapes, such as cove base and corner return units, travel the same line, but receive special treatment in the way of filling the return faces just before the block enter the oven. During the one hour elapsed time in the oven, the slurry is hardened into a solid mass firmly bonded to the block and possessing all of the qualities of the finished product.

At the end of the oven, the molds are stripped from the block faces and returned to the starting point for reuse. The finished block are inspected and cubed to allow cooling. The specials are trimmed on masonry saws. After cooling, the block are reinspected and loaded for shipment to the job site. Each block is covered by an individual slip-carton.

In the production of textural face units, the block themselves are loaded onto the first conveyor and carefully blown clean of dust or aggregate accumulation. In the preheat booth, the surface temperature of the block is brought up to 180 deg. F. and then in rapid succession three coats of glazing compound are sprayed directly onto the block in the spray booth. The sprayed block are then transferred to the oven and the glazing compound hardened to a glossy finish in another one-hour heat cycle. At the unloading end of the oven the blocks are inspected and cartoned ready for shipment to job.

The success of the Spectra-Glaze plant is enhanced by the modern, well equipped block plants operated by the Concrete Pipe and Products Co. The firm operates two Besser machines 16 hours a day, 7 days a week. All concrete masonry units are high pressure steam cured in steel autoclaves at a pressure of 125 p.s.i. for a period of 8 hours. Not only does this produce a pre-shrunk unit free from objectionable shrinkage cracking, but it turns out a finished product with moisture content well below 25 percent. Low moisture content is of great help in the Spectra-Glaze manufacturing process.

The Spectra-Glaze plant is equipped to process 2,500 tile face or 3,000 textural face units in an 8-hour day. The product has found wide acceptance among architects and engineers, not only for its economy, which is achieved primarily by labor saving in erection, but also for its beauty, and for the structural soundness which results when the load-bearing and finished wall are built in one operation. The plant in Richmond is regularly supplying block in the North Carolina and Washington, D. C. trade areas, and more than 50,000 units have been shipped into the Metropolitan New York area.

Tile face stretcher units are manufactured in all standard block sizes—2, 4, 6, 8, and 12 in. Tile face shapes, such as bullnose, quoin, cove base, and caps, are manufactured in 2 and 4 in. block sizes only. Blocks glazed on two faces in the same or different colors are available in 4 and 6 in. units. Textural face units are manufactured in all standard block sizes and may be glazed on any number of faces.

Tests of the glazing on Spectra-Glaze units indicate a high resistance to most common chemical solutions, and exposure to temperatures ranging from 10 to 230 deg. F. produces no cracking or softening. It is equally resistant to thermal shock and to the staining effects of such materials as cold lubricating greases, oils, and hot animal fats. The impact of a free-falling 1-in. diameter steel ball produced no microscopic cracking at a height of fall of 7 ft., at which point the test was stopped. The gloss and hardness of the glaze are not affected by an 8-hour exposure to steam vapors at atmospheric pressure, and compression loads up to 1,300 p.s.i. cause no damage. Although users are cautioned to exercise reasonable care in handling the units, job experience indicates that the surfaces readily withstand the normal marring effects of masons' tools and handling equipment.

Spectra-Glaze was developed as a stain-proof, color fast finish for interior surfaces, and the manufacturers do not at present recommend it for exposed installations. Despite this, tile face (Type B) units have been used in this fashion on several jobs, and there is no indication to date that they will not perform satisfactorily. Accelerated weathering tests with a weatherometer machine have shown little deterioration in runs equivalent to 30 years of service.

Other manufacturers of Spectra-Glaze masonry units include the Alton Brick Co., Alton, Ill.; Standard Block Co., Troy, N. Y.; and Yonkers Concrete Products Co., Yonkers, N. Y.

Statistics Bureau Reports 104,000 July Housing Starts

Housing starts held strong during July, when 104,000 new permanent nonfarm dwelling units were put under construction, according to preliminary estimates of the U. S. Labor Department's Bureau of Labor Statistics. A small increase in private housing was offset by a drop in publicly-owned units, resulting in an over-all 2,000-unit decline from June in the total number of new dwelling units put under construction. Nevertheless, the July total was 13,500 units greater than a year ago, and the largest for the month of July in any year except 1950.

Private housing starts totaled 102,400 in July—the first month in almost two years that the 100,000-mark was exceeded for private housebuilding. Part of the July strength in private volume resulted from increased housebuilding activity in or near defense areas, and at military and naval installations.

Public housing authorities started 1,600 units during July, as compared with 6,800 in June and 3,700 in July, 1951.

During the first seven months of 1952, a total of 669,700 new dwelling units were begun—10,800 short of the comparable total for 1951. However, private housing started thus far in 1952 (624,100 units) exceeded last year's January-July volume by 8,200 units, while the number of publicly-owned units begun (45,600) represented a 19,000-unit drop from last year's volume for the first seven months.

Ontario Ready-Mix, Inc., Buys Local Sand-Gravel Facilities

At Ontario, Oreg., facilities of a long-established industry, the Ontario Sand and Gravel Company, formerly operated by P. W. and J. W. Williams, recently were sold to Ontario Ready Mix, Inc.

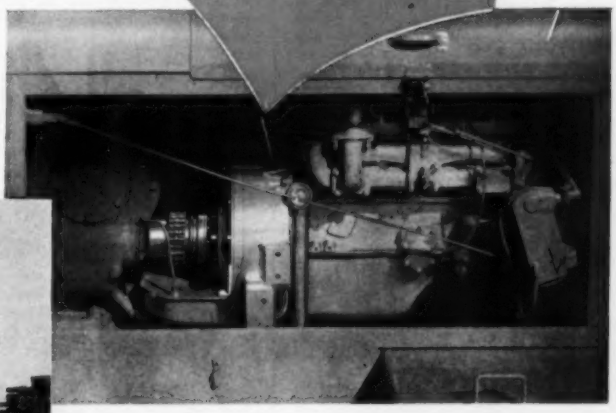
New owners of the plant are Lawrence Garside (president), James Robertson, and William Mott. Mr. Garside and Mr. Robertson operate a ready-mix plant in Portland. Mr. Mott, who will serve as secretary and manager of the Ontario operation, was associated with the former concern. New equipment is being installed, and other machinery will be added later.

According to a recent bulletin of the Concrete Masonry Manufacturers Association of Los Angeles, this organization now is issuing a monthly publication, *Concrete Masonry Review*. In the same bulletin we found the following cogent comment: "Trade association membership is a measure of judgment, because it offers a choice between unnecessary individualism, now quite out-of-date, and co-operation, as a means of economical business growth."

Announcing UNIT with FLUID TORQUE DRIVE

To a long line of improvements in design and construction, UNIT has added another advancement — FLUID TORQUE DRIVE. This torque converter application gives the operator a steady flow of power which he can regulate with smoothness and accuracy. Elimination of shock loads adds life to bearings, shafts, gears, and cables . . . brings maintenance costs down to a minimum. Excavating work is done with a strong steady flow of power, with no "stall" and no "delay" while the engine regains speed. Crane work can be done with greater smoothness of operation by throttle control.

UNIT offers the Chrysler Torque Converter as a standard installation at no extra cost on ½ yard machines equipped with 6 cylinder Chrysler Industrial Gasoline Engines.



SMOOTHER PERFORMANCE — Smoothness of operation is achieved in traveling as well as in lifting and digging. The Torque Converter in Mobile equipment allows for smooth break-away performance.

Time-saving, Cost-reducing Advantages

- Greater work output without increasing fuel consumption
- Eliminates "shock loads" on machinery, reducing maintenance cost
- Smoother and more accurate control of all operations
- Builds up line pull without excessive load on engine
- Full steady power for peak loads without stalling engine
- Quick engine pickup retains maximum line speeds
- Provides "regulated load handling" by throttle control
- Increases lugging power for hard excavating
- Engine clutch eliminated entirely
- Installation available at NO EXTRA COST

UNIT CRANE & SHOVEL CORP.
6401 W. Burnham St., Milwaukee 14, Wis., U.S.A.

Other UNIT machines are available in ½ and ¾ yard Excavators and Cranes up to 20 Tons . . . Crawler or Mobile Types . . . Gas or Diesel . . . Fully convertible to ALL attachments. Write for descriptive literature.

SHOVELS • DRAGLINES • CLAMSHELLS • CRANES • TRENCHOES • MAGNETS

A 7199-1PC

Perlite-covered Columns Pass Fire Test at Chicago

The thinnest, lightest, most compact construction designed to provide 2-, 3-, or 4-hour fire protection for structural steel columns has passed final fire tests at the Underwriters Laboratories in Chicago, according to an announcement by the Perlite Institute and the Metal Lath Manufacturers Association, co-sponsors of an extensive research and fire-testing program.

Final test in the recently completed series showed that a thin, 1⅜-in. coating of lightweight perlite-gypsum plaster on self-furring metal lath is sufficient to provide 3½-hour fire protection for steel columns. In previous tests using the same basic construction, a one-in. thickness of perlite-gypsum plaster received a 2-hour fire retardant rating, while a 1¾-in. thickness was given a 4-hour rating, the maximum required by any building code in the United States.

Sponsors claim that these new constructions have only one-seventh the weight of equivalent concrete or masonry fire protections, and therefore put less load on the structure, allowing important savings in structural steel supporting members. In addition, these new fire protections save valuable space and dollars because they not only fireproof but provide a finished plaster job ready for painting or papering.

The fireproofing qualities of thin coats of perlite-gypsum plaster are due to the insulating properties of the material.

Tennessee Concern Employs Unusual Plant Arrangement

According to word from the L. K. Lippert Company, London, Ohio, which furnished new equipment for the La-Lite Block Corporation's facilities at Lake City, Tenn., the latter's plant is now in operation.

A somewhat unusual arrangement of standard units was employed. The expanded shale aggregate (produced by the Lake City Light Weight Aggregate Corporation's plant near Briceville, Tenn.) is delivered by truck and dumped into a truck ramp-hopper, then elevated to the aggregate bin atop the roof. From this bin it feeds directly into the Besser mixer below, to be formed into units in the Besser block machine.

Bulk portland cement received by rail is unloaded through an undertrack screw into an elevator between two cement bins, so that it selectively serves both. A large-capacity cement bin directly over the undertrack screw permits the recirculation of reserve cement through the elevator into the cement batching bin, also located on the roof.

New York R.M.C. Concern Operating Automatic Plant

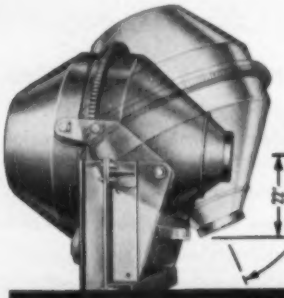
Operations of the Syracuse Ready-Mix Concrete Company at Syracuse, N. Y., have been carried on for the last few months in the firm's new central mixing plant. The new facilities are entirely automatic, from the time the aggregates are dumped into the hopper conveyor until the ready-mix is loaded into the trucks for delivery to customers. A featured service is the choice of wet or dry mix offered to the customer for transport in his own vehicles.

Officers of the 14-year-old company are as follows: Arthur W. Gessler, president and treasurer; William W. Nass, vice-persident; Wallace Roher, plant engineer; and John F. Mullen, plant manager.

Natl. Concrete Masonry Assn. Adds E. R. Mangotich to Staff

Edward R. Mangotich of Chicago recently joined the National Concrete Masonry Association's staff as assistant engineer. In his new position he will aid R. E. Copeland, director of engineering, in carrying out the Association's ever broadening technical activities.

Mr. Mangotich received his degree in Bachelor of Civil Engineering from Marquette University. In 1943 his college training was interrupted by a call to active duty in the Naval Reserve. He has held various engineering positions, having served in the Department of Commerce in the Bureau of Public Roads at San Francisco; as a highway engineer in connection with the Highway Location Survey in northern California; and as a civil engineer in design with the Vern E. Alden Company, consultant engineers.



TILT-UP

CLEAN UP with

FOR CONVERTING TO CENTRAL MIX
As it requires less headroom, the TILT-UP SuPREMIXER is the only mixer feasible in most plants. It's easy to install, no raising of the plant or lowering of drive.

FOR A PACKAGE PLANT
Reduced headroom requirement means reduced height, construction and power costs. Efficiently permits dry batch in one lane, central mix in the other.

FOR A SEMI-PORTABLE PLANT
Crane feeding is easy with SuPREMIX. Separate A-frame mounting with bin structures bolted for quick, easy set-up provide real flexibility for your rush defense jobs.

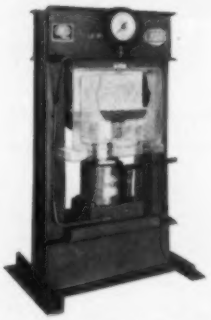
Only the SuPREMIX TILT-UP, 3-3½ yard hydraulically controlled mixer can give you *all* these advantages: lower headroom requirements—steeper discharge of 65°—no segregation—reduced thrust—and virtually fixed discharge. The hydraulic system is part of the unit—no costly compressor to buy. The unique features of this mixer make it the ideal mixer . . .

Aggregate Bins Cement Bins Cement Storage Elevators
Conveyors Ready Mix Plants Expressway Semi-Portable
Plants Dry Batch Plants

Manufactured by

L. BURMEISTER CO., 4535 W. Mitchell, MILWAUKEE 14, WIS.

***Jones* COMPRESSION TESTING MACHINE**



for more economical mixes, and uniformly higher strength

By doing your own testing of concrete blocks and cylinders, you will immediately discover anything which may have gone wrong with the aggregate, grading, mixing, etc. This will help you maintain more uniform quality and develop more economical mixes. The Jones (formerly Yoder) testing machine is low in first cost, specially designed for concrete products plants.

Send for list of satisfied users and literature.

***J. A. Jones* CONCRETE MACHINERY**
108 Morning Road, Pittsburgh 34, Pennsylvania

NEW MACHINERY and SUPPLIES

● Fork Truck Scoop

A scoop attachment for a fork truck has been designed by the Elwell-Parker Electric Company, 4205 St. Clair Ave., Cleveland 3, Ohio.

The scoop is made in sizes to match the truck on which it is to be used. The 4000-lb. capacity truck uses a 25 cu. ft. scoop while sizes for the 2000-lb. and 6000-lb. trucks are in proportion. Control of the scoop is by a double acting hydraulic cylinder so that loading and dumping are positively operated.

● Two-Mold Block Machine

A block machine that utilizes two molds and plain pallets has been announced by the Gene Olsen Corporation, Adrian, Mich.

The GOCorp "King" has one mold being charged and packed while the other mold is being finished and stripped. This results in a machine that is the same size as the "Senior" but with a production of 18 8-in. units per minute. The machine is fully automatic, hydraulic drive, front pallet feed, with resonant vibration.

The offbearer, a Ladwig type magnetic, handles two pallets each trip and returns with two empty ones which are discharged into position below the loaded ones. The empty pallets are automatically scraped, oiled, and turned over.

You can make $1,000 or more per month by using REHBERGER UNLOADERS!

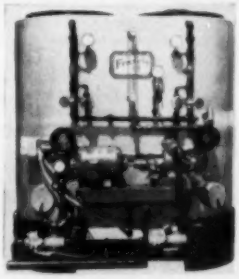
It is a matter of record that the Rehberger Unloader has proved itself a sure-fire profit maker wherever and whenever it is used. One user (name on request) states that he has increased profits to the tune of $1,000.00 per month with his one 6 cube unloader. Another case history shows a monthly profit of $1500 a month with the use of an 8 cube unloader!

Here is a thrifty, one man operation that reduces unloading time, vastly increases loads and delivers the same number of blocks and bricks with 2/3 less number of units.

Rehberger Unloaders are built for all makes of tandem axle trucks. You owe it to yourself to take advantage of this tremendous profit-making, push button unloading unit . . . it automatically slashes costs—shows immediate and lasting profits. Write for full information now.

ARTHUR REHBERGER & SON, INC.
320 FERRY STREET, NEWARK, NEW JERSEY
VEHICLE ENGINEERS FOR 66 YEARS

REDUCE Curing Costs . . . SPEED Curing Time
Do A BETTER Curing Job . . . with FRANCIS
STEAM GENERATORS



- Fully-automatic FRANCIS generators provide concrete-block plants with flexible, low-cost heat and humidity, so necessary for proper and rapid curing.
- Combined heat and moisture—or either semi-dry or saturated steam—may be generated as desired.
- Other features: no steam engineer required; steam up in 3 minutes from a cold start; twin units for standby protection; descaling system keeps coils clean. Costs half that of a conventional boiler.

• Write for full particulars!

Francis Steam Generator Co., Inc.
10202 E. Artesia Avenue, Bellflower, California

Picture of a
Money-Making
Money-Saving Machine

a LOW COST
National Car Shaker

SAVES UP TO 80%
OF UNLOADING COSTS

The National Car Shaker cuts labor costs and promotes safety because it can be operated by ONE man. It keeps unloading equipment operating at full capacity by eliminating the bottleneck at the unloading point. Its labor-saving, time-saving operation saves money — MAKES money for you.

UNLOADS CAR IN AS LITTLE AS 6 MINUTES

It gives you the maximum in speedy, economical unloading. Unloads coal, coke, cinders, sand, stone, aggregates and other bulk materials. A great help with frozen materials, too.

3 TYPES OF INSTALLATION

Jib Crane

Mono Rail

Wheel Cart

Write Today For Free Information
on how the National Car Shaker can save time and money for you.

PAT. PENDING

National Conveyor & Supply Company

348 N. HARDING AVE., CHICAGO 24, ILL.

● Masonry Waterproofing

A water solution of silicone resin compounds for use on masonry surfaces high in lime has been brought out as "Hydrocide S.X. 2210" by the Building Products Division, L. Sonneborn Sons, Inc., 80 Eighth avenue, New York 11, N. Y.

The material is said to be colorless, non-inflammable, non-staining, and water repellent. Life of the coating is believed to be 10 years. It is claimed that masonry surfaces coated with the material will not absorb moisture and still will breathe.

● Concrete Densifier

A material for densifying concrete to increase its heat-conductivity for radiant heating applications is being marketed under the name of "Heatcrete" by Lee-Don, Inc., Harmarville, Pa.

The material is a granular mineral that is physically and chemically stable, and that does not expand or contract. It adds to the conductivity of the concrete by its own greater conductivity than that of most aggregates and by creating a denser concrete which is made with less water and has less insulating voids. It also creates a hard, resistant surface that is said to withstand heavy traffic uses.

The material has been used for creating snow-melting sidewalks and for radiant-heated lobbies in some large commercial projects in Pittsburgh, Pa.

● Fork-Lift Trucks

Two new models of "Utilitruc" fork-lift trucks have been brought out by the Industrial Truck Division, Clark Equipment Company, Battle Creek, Mich. They are in the 6000- to 7000-lb. range.

Among the features of the new models are a new fork mounting that permits interchangeability of attachments; free-lift of more than 25 in. without an increase in upright height; greater driver visibility; maximum accessibility of the motor; and cushion type tires.

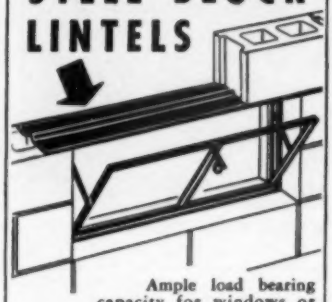
One of the models is powered by storage batteries operating electric motors. This model has an automatic parking brake that sets when the operator's seat is unoccupied.

The gasoline powered model has either a "quick-change" clutch or a "Dynatork Drive" which utilizes magnetic induction force to drive the wheels. A constant-mesh reversing gear adds to the smooth operation of this model.

Pivoted steering axle, close turning radius, and angularly placed tie-rods are standard on both models.

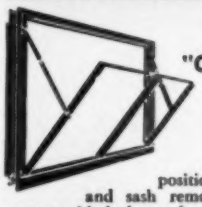
For better, stronger window installations

VENTO
STEEL BLOCK LINTELS



Ample load bearing capacity for windows or doors. Available from 2-ft. 6-in. to 5-ft. Formed from 10 gauge hot rolled steel with stiffening crimp in center. Beveled edge provides masonry bond and seat for mortar. Saves costs through use with standard 8-inch blocks. Vento pressed steel angle lintels for brick construction also available.

VENTO STEEL BASEMENT WINDOWS



VENTO "CHAMPION"

Three sizes. Effortless operation gives three position ventilation and sash removal. Double contact with leak-proof water-shed sill stops wind and rain. 14 gauge electric welded frame. Fins welded to jambs for easy installation in block or poured walls.

VENTO "THRIFTY"

A real economy window for lower cost housing. Three sizes, sturdy construction, smooth operation, two position ventilation and easy sash removal. Fin flanges at jambs for quick installations.

Also casement, utility and barn windows. Write for full information.

VENTO STEEL PRODUCTS CO., INC.
254 COLORADO AVE. BUFFALO 15, N.Y.

3 Ways to get BIGGER PAYLOADS *Legally!*

Your problem today is to deliver BIGGER loads of concrete and *still stay under highway weight limits.* You can solve the problem with any one of these three job-tested Smith-Mobile Truck Mixers. They permit better weight distribution, greater payloads and more take-home dollars. All carry NRMCA rating plates. Write for new bulletin.

SMITH-MOBILE with Rear Engine Drive

1

Engine moved to rear of mixer, thereby cutting almost 20" off the over-all length. Enables you to move your mixer forward, thus shifting center of gravity and putting a bigger share of the load on the front axle. Gives you better weight distribution without using Cab-Over or Cab-Ahead type of trucks. Or, you can use a shorter wheelbase truck and get greater maneuverability. Both engine and transmission are completely accessible. Three standard LOADLIMIT sizes: 4½, 5½ and 6½ cubic yards as mixers, with higher ratings for agitators.

SMITH-MOBILE with Truck Engine Drive

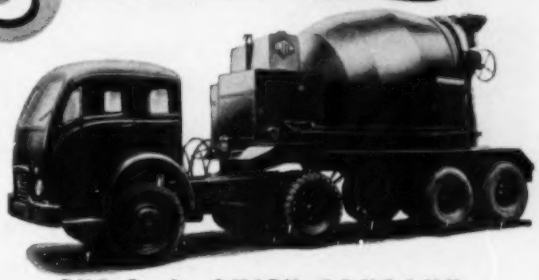
2

Mixer engine eliminated. Reduces dead weight of mixer by about 1300 lbs. Mixer can be mounted closer to cab, removing considerable weight from rear axle and putting it on front axle. Enables you to meet stringent rear-axle load restrictions. One engine instead of two also means less fuel consumption, less engine maintenance. Available for both LOADLIMIT and CLOSED END models, in 4½, 5½ and 6½ yd. sizes, higher ratings for agitators.

SMITH-MOBILE Trailer Mixer

3

Enables you to carry from 8 to 9 yard payloads and still be within highway load limits. Most states are more liberal with payloads allowed on semi-trailers than they are with loads carried in standard truck mounted mixers. Trailer Mixer can carry up to 12,000 lbs. additional concrete, legally, depending on state regulations . . . is just as easy to maneuver in most cases. Tractor can also be used for many other purposes. Available for 6½ yd. mixer, 8⅝ yd. agitator, LOADLIMIT and CLOSED END models.



THE T. L. SMITH COMPANY
2887 N. 32ND ST. • MILWAUKEE 45, WISCONSIN

SMITH
THE T. L. SMITH CO. MILWAUKEE, WIS. U.S.A.

CONCRETE MIXERS

For BIGGER and BETTER Concrete Mixers and Truck Mixers . . . LOOK TO SMITH

a DAVID in size . . . a GOLIATH in production . . .

Remarkable portability **is the keynote of this BUTLER Ready Mixed Concrete Plant. The 85 yard 4 compartment bin ships in one piece. Legs and bracing, when knocked down, complete a load for one flat car or low-bed trailer. A second load is made up of elevator, batchers and one-piece overflow cement bin. Erection is quick and easy with a crane and 3 men.**

A number of portable BUTLER Ready Mixed Plants as well as many installations of BUTLER *engineered design* are shown in Butler Bulletin 185. Write for your copy today.

Portability **makes location at your job site practical; eliminates a large investment in costly truck-mixers. And with well co-ordinated delivery of materials either to crane, belt conveyor or elevator — production will be equal to the usual Goliath-like plant.**

For the contractor **meeting tight schedules in any building construction, this plant provides complete control in quality and delivery, to match his requirements. For every pour, large or small, the plant's versatility in production and the low investment required means lower cost per cubic yard and a correspondingly greater profit.**

BUTLER BIN CO. 987 Blackstone Avenue **WAUKESHA, WIS.**

HYSTER® 40 Lift Trucks
handle loads faster and cheaper in
CONCRETE PRODUCTS PLANTS

Hyster 20 (2000 lb. capacity)

Hyster fork-type Lift Trucks, Turret Trucks, Straddle Trucks® and Karry Kranes® have capacity ranges from 1000 lbs. to 30,000 lbs. Sold and serviced by Hyster dealers around the world.

SPEEDY AND POWERFUL. Equally efficient in a crowded plant or in the open spaces of yard storage—great maneuverability. Pneumatic tires permit Hyster 40 to work equally well indoors or outdoors. 4000-pound capacity. Several heights of lift available. Free-lift models. Width of truck—43 inches.

SIMPLE TO OPERATE — EASY TO SERVICE. Conventional controls. Operator rides easy in a comfortable, adjustable, form-fitting seat. Overhead guard protection. Excellent visibility...Truck is designed to make easy all inspection and service operations.

SEE YOUR HYSTER DEALER for a demonstration and list of owners. Or write for literature.

HYSTER COMPANY

THREE FACTORIES

2926 N. E. CLACKAMAS ST., PORTLAND 8, OREGON
1836 NORTH ADAMS STREET...PEORIA 1, ILLINOIS
1026 MYERS STREET.....DANVILLE, ILLINOIS

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Every issue of PIT AND QUARRY is full of information you can use in your business. It gives you practical ideas on every phase of your operations.

To keep its readers fully informed, PIT AND QUARRY taps every source. Our field editors travel more than 30,000 miles a year to describe the processes and methods used by the outstanding plants making your type of product. Government activities affecting the field are interpreted so that you can better adjust your business to their regulations. Complete reports of all important conventions are published in PIT AND QUARRY. The new equipment and supplies which may make production more efficient are announced in each issue.

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...YOU CAN'T BEAT CHALLENGE

MORE CUBIC FEET OF DRUM SPACE FOR YOUR INVESTMENT
EARN ADDITIONAL PROFIT ON EVERY TRIP

When selecting your next truck mixer, add all the advantages of Challenge Mixers together . . . lower initial cost . . . lower maintenance cost . . . lightweight . . . immediate availability of standard automotive repair and replacement parts . . . PLUS the advantage that four of Challenge's *six* sizes have greater "rated" drum volume. You'll come up with only ONE answer . . . *Challenge is by far your greatest mixer buy!*

Clip the coupon below for the name and address of your nearest Challenge Dealer.

"COMPARE THE COST PER CUBIC FOOT OF DRUM SPACE OF CHALLENGE WITH ANY COMPETITIVE MIXER".

CHALLENGE MIXERS		COMPETITIVE MIXERS		EXTRA
SIZE	CUBIC FEET DRUM VOLUME	SIZE	CUBIC FEET DRUM VOLUME	CUBIC FEET DRUM VOLUME IN CHALLENGE
3½	174	3	153	21
4	195	3	153	42
5	241	4½	218	23
6	290	5½	263	27

Challenge Mixer Sizes conform to the basic Truck Mixer Manufacturers Bureau standards of total cubic feet of drum space in relation to rated mixer size and concrete payload capacity.

COOK BROS. EQUIPMENT CO.
Exclusive National Distributors For Challenge Truck Mixers . . . the profit line

1815 No. Broadway, Los Angeles 31, Calif.
Telephone: CApitol 2-9111

Manufacturers of: HEAVY DUTY TRUCKS • TRUCK EQUIPMENT • DUAL CHAIN DRIVES • DUAL GEAR DRIVES • HYDRAULIC HOISTS • DUMP BODIES • TRAILERS • TELESCOPIC DUMP TRAILERS • BOTTOM DUMP TRAILERS • LUMBER TRUCKS • SIX WHEEL ATTACHMENTS FRAME EXTENSIONS

Cook Bros. Equipment Co.
Please send name and address of nearest Challenge dealer.

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Member N.R.M.C.A.

To The "POURING POINT"

with ALL-WHEEL DRIVE

Mud and bad ruts are common sights on construction jobs. These features give you that extra "push" of a crawler tractor and maximum traction when it's needed most.

FRONT WHEEL DRIVE
TANDEM REAR AXLES
TEN FORWARD SPEEDS
HEAVY DUTY FRAME
OVER LOAD SPRINGS

MEMPHIS EQUIPMENT COMPANY
766 SO. THIRD ST. **MEMPHIS, TENNESSEE**

the FORNEY Compression TESTER

Sells Your Products - - - Increases Your Profits

Whether you produce concrete building units, concrete products or just concrete — daily testing will increase yields, profits and customer confidence.
The FORNEY direct reading gauge makes daily testing easy and profitable.

Write for complete information

FORNEY'S inc. 203 ELM STREET · NEW CASTLE, PENNSYLVANIA

All-welded ELEVATOR BUCKETS

light • durable • quick cleaning

For maximum elevator capacity with minimum h.p. requirements, use Johnson cement and aggregate buckets. All-welded steel, with heavy-gauge lips and ends, they're light, durable, smooth for fast filling, quick cleaning. Three sizes cement: 10x6", 12x7", 14x8" . . . 4 aggregate: 10x6", 12x8", 14x8", 16x8".

Long-life steel chain has carburized steel knuckles, medium carbon steel side bars, welded bucket lugs, alloy heat-treated ½" pins. You'll find that carburized steel parts last longer than malleable iron.

Mail to C. S. JOHNSON CO. Champaign, Ill. *(Koehring Subsidiary)*

Send information on: ☐ buckets ☐ elevator chain for _____ (type of material)

NAME _____ CO. _____
STREET _____
CITY, STATE _____ J243PQ

CARPENTER

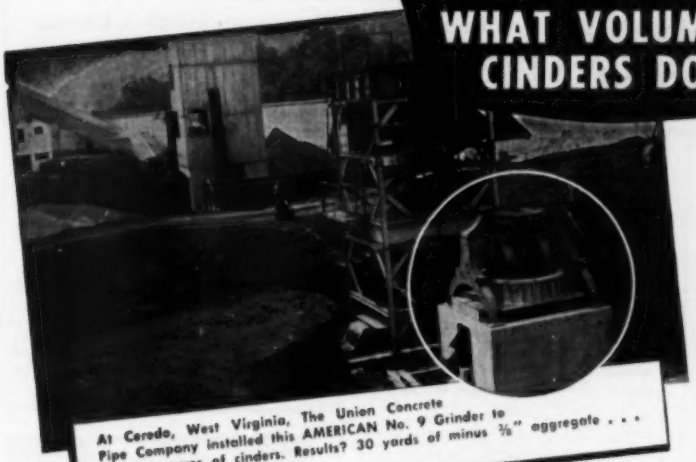
SEPTIC TANK EQUIPMENT

Preferred from Coast to Coast

There's a ready and profitable market everywhere for quality septic tanks produced with modern, high-speed CARPENTER Forms and Handling Equipment. Only one man needed for delivery. Don't delay—write us today!

CARPENTER MANUFACTURING CO.
Phone 22018, R.F.D. 1, Box 470, Richmond 23, Virginia

WHAT VOLUME OF GROUND CINDERS DO YOU NEED?



At Coredo, West Virginia, The Union Concrete Pipe Company installed this AMERICAN No. 9 Grinder to work on acres of cinders. Results? 30 yards of minus ⅜" aggregate . . . every hour, every day.

Select from 8 AMERICAN Grinders Hourly Output 4 Yards to 75 Yards!

Write your own ticket for your plant's cinder-grinding requirements . . . one of the 8 AMERICAN Grinders will give you the output needed . . . deliver minus ⅜" mesh aggregate without additional separation! Your AMERICAN Grinder will require minimum maintenance . . . will conserve power . . . will help produce low-cost, top-quality cinder block. Write . . . wire . . . phone . . . ask for an AMERICAN grinding expert to help you lick your problem.

CAPACITIES . . . YDS. PER HOUR

No. 5 4	No. 9 30
No. 6 6	No. 482 35
No. 7 12	No. 418 50
No. 8 20	No. 384 75

American GRINDERS by
W. A. RIDDELL CORP.
BUCYRUS, OHIO

Lafayette CONCRETE PIPE COMPANY
INCORPORATED

Lafayette, Louisiana
March 7, 1952

Houston Concrete Machinery
116 Heights Boulevard
Houston, Texas

Gentlemen:

We will have had our Dixon Model "DH" Packerhead Pipe Machine in operation one year on next Saturday March 15, 1952.

We feel that the Model "DH" is far superior to our old Model "D" and we had no complaints on it. Using one stripper, two off-bearers, the machine operator and the mixer man we produce in excess of 3000 feet of 4" Bell & Spigot sewer pipe in 8 hours and allow 30 minutes for cleaning up in the afternoon. The production on all other sizes is in proportion.

Our Batching plant is, as you know, one of the latest design and our aggregates are of the best quality. As a result we have been able to consistently produce top quality pipe that always exceeds specifications in every respect.

We appreciate the overnight service from Houston on wearing parts which enables us to keep our inventory to a minimum.

We cannot commend your machine too highly and want to take this means to express our deep appreciation for your splendid cooperation during the years of our pleasant association.

We invite you and any of your customers to come and visit our modern plant at any time and extend best wishes for your continued success.

Cordially yours,
LAFAYETTE CONCRETE PIPE CO.

Thomas G. [illegible]
Manager

HERE'S WHAT ONE USER THINKS ABOUT HIS Dixon PIPE MACHINE

For the full story of this modern hydraulic pipe machine, which is pleasing many users all over the country, WRITE FOR OUR NEW, 52-PAGE CATALOG.

HOUSTON CONCRETE MACHINERY CO.
Office and Mailing Address: 116 Heights Blvd. HOUSTON, TEXAS
Plant: 6600 Washington Ave.

Manufacturers of:

Dixon Pipe Machines	Septic Tank Forms
Pipe Bend Machines	Dixon Conveyors
Dixon Mixers	Off-Bearing Carts

Concrete Manufacturer Classified Section

431 S. DEARBORN ST., CHICAGO 5, ILL.

Advertising Rate Per Issue: $10.00 a Column Inch. Lower Rates on a Contract Basis — Write for Rate Card.

[Additional Classified Ads on Pages 185-193]

FOR SALE

Sand and Gravel Plant Two Ready-Mix Plants

250 acres choice gravel land with modern gravel and ready-mix plant located next to one of the largest government projects in the Middle West.

Two ready-mix plants, one located at gravel plant, other in nearby city. Plants serve 30-mile area, including six towns and three colleges.

Gravel plant and ready-mix plants running every day. Hoists, crusher, etc., in fine condition. 11 high-discharge mixers, 3 dump trucks, 1½-yard crane, garage equipment, welders, 2 loaders, elevators, etc., everything necessary for running a complete plant. Plenty of water. All plants electrified. Now have government, state, and county contracts. Opportunity for blacktop, block, and concrete products plants. Price $350,000 with 50% cash. Business now showing good profit. Reason for selling health.

Write: Box No. W-2,
c/o Concrete Manufacturer
431 S. Dearborn St., Chicago 5, Illinois

FOR SALE

Lith-I-Bar 2 block fully automatic machine with air offbearer. Purchased new in Aug. 1951. With the following attachments 3", 4" core or solids, 6", 8", 12", Square or round chimney. Also extra mould box for quick change over. 10 hp air compressor.

Can be seen at
The Goodman Cinder Block Plant
Erie St. Honesdale, Pa.
Phone 1106

Priced for Quick Sale

1—No. 9 and 1—No. 7 Stearns Joltcrete, each complete with electrical controls, power carriage and air lift offbearer. With the No. 9 modular 6" and 8" attachments, 4"-8"-12" modular attachments with the No. 7. Modular press steel pallets for all attachments. 1—Stearns and 1—Link-Belt 28 cu. ft. mixers with motors and drive. 2—Stearns 28 cu. ft. Vertical Skip Loaders complete with motors and switches. 76—Chase No. 294 Steel Racks (72—8" block Cap.)

Guy D. Moody
822 Park Street, Bristol, Virginia

LOWER COST
PACKER-HEAD WINGS
Proved to last as long or longer — yet cost considerably less. Write for prices.
TEXAS FOUNDRIES
LUFKIN, TEXAS

FALL CLEARANCE

SHOVELS & CRANES

Insley "K-14" ¾ yd. Dragline, Reconditioned
Insley "K-12" Used ½ yd. Dragline
Insley "K-10" Used ¾ yd. Shovel
Bantam Used Drag & Hoe, on GMC 6x6

TRANSIT MIXERS

Rex 3 yd. Used Hi-Discharge Moto-Mixer
Blaw-Knox 4½ yd. Used Hi-Discharge Transit Mixer. 1 yr. old.

MISCELLANEOUS

Martin "333" 10-Ton Tag-A-Long Tilt-Top Trailer, slightly used.
Schramm "60" Used Portable Compressor
Universal Port. Pulverizer Plant: #5 Pulverizer, Murphy "ME-66" diesel power, plate feeder, 4 x 8 screen, etc. Pneumatics.
Cummins Diesel — Electric Plant, 50 KW, Priced right.
Cletrac "DGH" Used Gas Tractor w/ Drott Loader, 1100 hours.

EIGHMY EQUIPMENT COMPANY
120 S. PIERPONT ROCKFORD, ILLINOIS

SPACE HEATERS

War Surplus Bargain

New — Ready To Use!

40,000 BTU capacity

—Burning gasoline, kerosene or diesel fuel.

—Electric blower—12 V. DC or 110 V. AC using small transformer which we furnish with each heater.

Portable, Quick, Clean Heat

Ideal for curing room, concrete plants, work under construction, emergency heat, or auxiliary heaters.

$95.00 each

Clapp, Riley and Hall Co.
14 No. Clinton St.,
Chicago 6, Illinois

FOR SALE

1—1950 Model Gocorp Junior
1—4" Mould Box—no pallets
1—10" Mould Box—no pallets
Excellent Condition $4,000.00
1—1947 Model #9 Joltcrete
1—5 H.P. Air Compressor air operated offbearer
1—8" Mould and 5,000 8" cored pallets (steel)
1—4" Mould Box and 3,000 4" cored pallets (steel)
1—10" Mould Box
2—Turn Tables
75—Racks
8" Mould box brand new purchased in March, 1952
Also some spare parts..... $4,500.00

Anthony Coal & Supply Company
5801 Southern Boulevard
Youngstown, Ohio

REBUILT JAEGER DRUMS

Two—Model 3HC (1950-51) bare drums with mixing blades. 75-80% of usable life. Perfect condition. Trunnion rings thoroughly reinforced.

Contractors Machinery Company
P. O. Box 8057 Phone: Pershing 3196
San Antonio 12, Texas

FOR SALE
BRICK PLANT
TORONTO, CANADA

All equipment and buildings to commence production of concrete products, including Jackson & Church brick press Model A, kilns and two acres land for expansion. Railway siding. Price right — terms. Apply, **Everett E. Ott & Company, Certified Public Accountants, 67 Yonge Street, Toronto, Ontario, Canada.**

UNBREAKABLE
PALLET RINGS
Write for full information
TEXAS FOUNDRIES
LUFKIN, TEXAS

FOR SALE

Dunbrik plant, complete, with 14,000 production, good condition, also 5,000 extra pallets, 3-brick type.

Troy Dunbrik Corp.
R. D. 4 Troy, N. Y.

TROUGH BELT

Conveyors

Elevate: SAND • GRAVEL
REDI-MIX CONCRETE

SEND FOR CATALOG
NEW LONDON ENGINEERING COMPANY
New London, Wisconsin

Excellent Ready Mixed Concrete, block & light contracting for sale, ill health—reason for selling.

Box No. S-15, c/o Concrete Manufacturer
431 S. Dearborn St., Chicago 5, Ill.

FOR SALE

Complete Block Plant equipped with Besser Vibrapac Block machine—18 ft.—Besser Mixer 24 ft.—Besser Skip—1800 Steel Pallets—41 Racks—Panel of electric switches and motors for operating machinery—All in good condition. Can be seen in operation to November 1st.

OTTO ZELLER
1323—3rd Avenue S. E. Aberdeen, South Dakota

UNUSUAL OPPORTUNITY TO OWN AND OPERATE
BESSER VIBRAPAC BLOCK PLANT

One of the best plants—located in a busy section of Eastern Pennsylvania. RR siding. Large, well established. Second machine No. 9 Joltcrete with pallets. Fully complete with Blaw-Knox Stell four compartment bins, weighthatcher, bulk cement equipment. Nine Kilns with new boiler & oil burner. Lintelator, crusher, two towmoters, one Clark lift truck, Scoopmobile, Five motor trucks.

Would cost well over $225,000 to duplicate. $20,000 recently spent to modernize plant. Priced to sell—Good reason for selling.

Some cash required and a successful block plant background essential.

Wire or write:
BOX NO. T-8, c/o The Concrete Manufacturer
431 South Dearborn Street Chicago 5, Illinois

CONCRETE MANUFACTURER CLASSIFIED SECTION

MINERAL COLORS
for
BRICK MORTAR
STUCCO-PLASTER-CONCRETE
"Fine Because of Their Fineness"
Ask for samples and recommendations.
BLUE RIDGE TALC CO., INC.
HENRY, VIRGINIA

FOR SALE
1—2 yard Smith concrete mixer
1—2 yard Jaeger mixer
1—3 yard Rex mixer
all need some work, will sell cheap.
READY MIXED CONCRETE CO.
P. O. Box 312 Wausau, Wisconsin

FOR SALE
Besser Super K3 Block Machine
Besser 30 cu. ft. Mixer
Besser 30 cu. ft. Skip Hoist
Equipment in good operating condition
70 Racks
Price complete $4500.00
Will sell separately — we need the room.
HOR-CRAFT MANUFACTURING CO., INC.
Bowie, Maryland

FOR SALE
Multiplex and Stearns Clipper A cored pallet machines with extra boxes and pallets for 4x8x16, 4x8x12, 8x8x16 and 8x8x12. Valued at $3,000. All in A-1 shape. Make offer.
ENTWISLE'S CONCRETE BLOCK
5290 Forestville Road Washington 19, D. C.
Phone: Hillside 4252

100,000
PRESSED STEEL PALLETS
in Stock
Send tracing or pallet for quotation.
GENERAL CONCRETE EQUIPMENT CO.
307 Hunter Street
Dept. PQ
Gloucester, New Jersey

FOR SALE
1—Van Ornum two unit plain pallet Block Machine
Attachments for 2", 3", 4", 6", 8", 12" — 16" & 18" long
15 H.P. Air compressor
35—60 block racks
1400 plain pallets
Skip Loader
Concrete mixer (2 bag)
Priced to Sell
DE ANGELO CONCRETE UNITS COMPANY
Vare Avenue & Ritner Street, Philadelphia 45, Pa.

FOR SALE
Allis Chalmers Model W M Crawler Tractor Equipped with ½ yard bucket and Dozier Blade. $2000.00 F.O.B. Good condition.
STOWERS CEMENT PRODUCTS
440 W. Elm Street Lebanon, Indiana

FOR SALE
21 Ton Bin — 3 Compartment with Weigh Batcher Belt & Bucket Conveyor
Master Gear Motor
Truck Hopper Equip. used 2 yrs., now in operation.
WILFLEY BLOCK COMPANY
Fulton, Missouri

YOURS TO SERVE
If you have not found the equipment you are looking for, the research dept. of The Concrete Manufacturer can and will gladly assist you. Tell us what it is . . . Write to
Research Dept.
C/O The Concrete Manufacturer
431 S. Dearborn St. Chicago 5, Illinois

HELP WANTED
EXCELLENT OPPORTUNITY WITH ESTABLISHED COMPANY FOR SUPERINTENDENT AND FOREMAN EXPERIENCED IN MANUFACTURING CAST AND MACHINE MADE CONCRETE PIPE. STATE AGE AND EXPERIENCE. SALARY OPEN.
UNITED STATES CONCRETE PIPE COMPANY
1500 Union Commerce Bldg., Cleveland 14, O.

HELP WANTED
Experienced concrete foreman or engineer to supervise 25 workers in concrete products plant. Permanent position. State experience and salary expected.
Box 274
Union, New Jersey

WANTED TO BUY
Septic Tank Forms State Approved—500 to 750 Gal. Must have Baffles.
STOWERS CEMENT PRODUCTS
440 W. Elm St. Lebanon, Ind.

WANTED
Brick attachment with pallets for Model 9 Joltcrete
Thos. W. Noble Co., 520 N. Michigan
Chicago 11, Illinois

CEMENT COLORS
Write for free samples and prices of "LANSCO" CEMENT COLORS produced in 24 attractive shades. Packed in bulk and in 1 lb. and 5 lb. packages.
manufactured by
LANDERS-SEGAL COLOR CO.
71 Delevan St. Brooklyn 31, N. Y.

BUILD GOOD WILL
Advertising Necessities for the Concrete Block and allied trades. Masons' Line Pins, 4' Yardsticks and 6" Celluloid rulers with special concrete block scales. Concrete Volume Calculators, Concrete Mix Selectors. Also the new Concrete Block Quantity Calculator. All imprinted with your advertising. Complete catalog on request.
Gerson Co., 97 Doering Road, Mattapan, Mass.

STOP *that* WATER
With FORMULA NO. 640
A clear liquid which penetrates 1" or more into concrete, brick, stucco, etc., seals—holds 1250 lbs. per sq. ft. hydrostatic pressure. Cuts costs: Applies quickly—no mixing—no cleanup—no furring—no membranes. Write for technical data—free sample.
HAYNES PRODUCTS CO., OMAHA 3, NEBR.

WANTED TO BUY
1—Good used relinable 10 in. Mold box and 2500 10 inch Pressed Steel Pallets for Stearns #9 Joltcrete Machine. In reply state condition of equipment and lowest cash price.
Minnesota Concrete Products Co., Inc.
Mankato, Minnesota

LIFT TRUCKS FOR SALE
1952 Erickson Six Fork
1952 Yale Electric Platform
1952 Ford Front End Loader
AMERICAN CONCRETE SERVICE
HAMILTON, OHIO

SPECIAL

JAEGER 4½ Yard STREAMLINERS mounted on 1946 Ford Trucks equipped with Cook Bros. Dual Center Chain Drive. Units (trucks' mixers) AS IS, but in good serviceable condition . . . same as they came to us from a major fleet where they were well maintained and on the job every day.

Just try to beat this price for a truck and 4½ yard mixer in working condition $1750

OTHER OUTSTANDING VALUES

- **JAEGER Model 2HM, Hi Discharge Streamliner. Reconditioned, sand blasted & painted . . . a real value!**
- **JAEGER Model 3HM Hi Discharge Streamliner. Reconditioned, sand blasted & painted . . . you can't beat this one for price!**
- **JAEGER Model 4½ HM, Hi Discharge Streamliner. Reconditioned, sand blasted & painted . . . this one's a steal!**
- **JAEGER Model 4½ HM. AS IS, but in serviceable condition . . . a good Buy!**
- **CHALLENGE 3 Yard Mixers, truck mounted . . . 1948 and later. Priced to sell!**

Because of the great demand for new and larger profit-making Challenge Mixers, we have one of the largest stocks of good used mixers on the market . . many good values resulting from trade-ins are available. Tell us your needs . . we'll send you snap-shots of the equipment together with complete information.

COOK BROS.
Equipment Company
1815 No. Broadway, Los Angeles 31, Calif.
Telephone: CApitol 2-9111

FOR SALE
1—½ bag rotary mixer.
1—3 H.P. Motor plus block machine.
Tamper equipped with electric motor and all belts and pallets ready to operate. Machinery all new and used for about 5000 blocks only.
W. W. WANGLER
Box 86 Walnut, Illinois

STEEL SHORT! · · · PROFITS LONG!

· · · when you MAKE and SELL CONCRETE LINTELS and SILLS

• • • • •

Popular KENT LINTELATORS are economically producing lintels and sills in various lengths and sizes which satisfy the increasing requirements of builders everywhere.

With steel difficult to obtain there is an even greater than normal demand for these proven products.

Then, too, their lower "on the job" installation cost is a big factor to the builder, resulting in a greater ultimate profit to him.

Don't let another day slip by without getting the complete facts and figures on KENT LINTELATORS.

Write at once for the bulletins.

Lintelators are available with special motor driven mechanical vibrators which reduce noise.

SUPER LINTELATORS
Make lintels 7⅝" HIGH by 3⅝" 5⅝" 7⅝" 9⅝" 11⅝" WIDE in these lengths.

S 6	2'8" up to 6'
S 7	2'8" up to 7'4"
S 8	2'8" up to 8'8"
S 9	2'8" up to 9'4"
S10	2'8" up to 10'8"

STANDARD LINTELATORS
Make lintels 7⅝" HIGH by 3⅝" 5⅝" 7⅝" WIDE in these lengths.

No. 6	2'8" up to 6'
No. 7	2'8" up to 7'4"
No. 8	2'8" up to 8'8"
No. 9	2'8" up to 9'4"
No. 10	2'8" up to 10'8"

The KENT MACHINE CO. Cuyahoga Falls, Ohio — Concrete Products Machinery Since 1925

Here's a Pointer ···to Better Block Production

Many satisfied customers operating scores of machines.

Write for name of Oswalt-Serviced Plant nearest you.

OSWALT SERVICE
INCREASES OUTPUT FROM VIBRAPACS WITHOUT SACRIFICE OF QUALITY

Let's point out a few facts!

By re-equipping your Super Vibrapac with Oswalt Service, you will gain enough in production and economy to pay for the investment over and over again. Here's why:—

You get high speed production without sacrifice of quality.

Smooth, continuous operation and maximum plant efficiency.

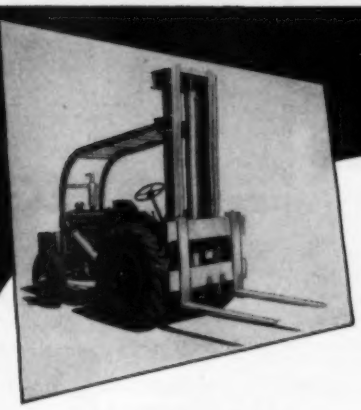
Savings in labor, equipment and maintenance costs.

A sure profit on your investment.

Our business is built on dependable service and guaranteed results. We can show you how to insure top level operating efficiency of your Vibrapac machine.

The Complete Story — in the New OSWALT BOOKLET

OSWALT ENGINEERING SERVICE CORP.
1335 Circle Ave., Forest Park, Illinois
Phones: EStebrook 8-3666 · FOrest 6-3898



Is Materials Handling Over ROUGH Ground YOUR Problem?

TRACTO-LIFT'S new Power King Series is the perfect solution! Engineered and built for tough jobs where rough, unpaved ground *demands* a high clearance underneath, TRACTO-LIFT'S Power King fork lift features over-size pneumatic tires with maximum traction. Built for maximum versatility, it has a wide range of speeds—6 forward and 6 reverse. Yet for all its advantages, Power King still *costs less* than any other fork lift of equal size and capacity. Consolidate materials stored outside . . . utilize wasted space with one of the 3 giant-size models in the rugged new TRACTO-LIFT Power King Series.

Write TODAY for complete specifications and illustrated folder on Tracto-Lift's new POWER KING Models No. MU-100, MU-125 and MU-150.

POWER KING FACTS

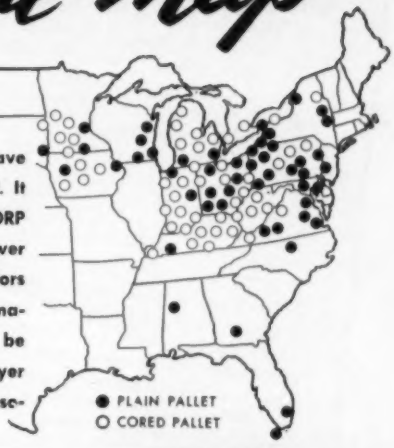
- Lifting height, 10' - 25'.
- Lifting capacities, 10,000 - 15,000 lbs.
- Fork lengths, 36" - 108" in 6" variations.
- Climbs inclines up to 20%.
- Parts and service for standard industrial tractor unit available throughout the world.
- Complete line of versatile attachments available.

TRACTO-LIFT Company
800 East 18th St. Kansas City, Mo.

Get on the Map— with a GOCORP

You'll be in good company. As you can see, GOCORP in three short years has effectively invaded the most competitive areas in the concrete products industry.

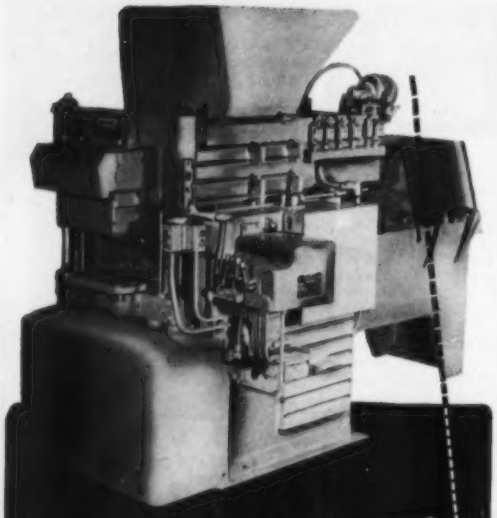
There must be reasons why these successful operators have modernized with a GOCORP. It boils down to this — a GOCORP makes better blocks at a lower unit cost. Also, these operators know that their GOCORP machines are old enough to be proven but so new that the buyer is protected against early obsolescence.



Why not write for the locations of plants near you? GOCORP owners will be happy to have you see their machines in operation and tell you of their experience.

GO CORP
ADRIAN-MICH.

403 Grace St. • Phone 2120



Columbia BLOCK MACHINES

"LEAD the FIELD"

...IN LOW INITIAL COST... HIGH PRODUCTION AND ECONOMY OF OPERATION

FROM COAST-TO-COAST, operators find the Columbia line a leader in its field! Its compact, rugged construction assures longer performance under most severe operating conditions ..moving, rotary parts are made with needle bearings, hardened pins and enclosed within the machine for protection from grit.

COLUMBIA'S 100% oil hydraulic, fingertip controls and automatic pallet feeder offer higher production capacities and utmost economy. Its flexible operation—from fully automatic to manual in a flip of a switch—is an advantage when changing molds or starting or ending a shift.

THE COLUMBIA IS SIMPLE IN DESIGN and produces precision, modular blocks from over 200 different types of molds and uses either light or heavy weight aggregate. Parts are standard. Steel or wood pallets may be used. Dollar for dollar—the finest machine on the market today! Write for complete details.

SALES AND SERVICE THROUGHOUT THE WORLD

There is a Representative in Your Area
Write for Name and Address

Columbia MACHINE WORKS

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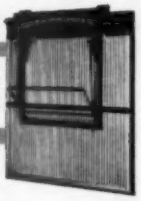
BETTER KILN CLOSURES

Universal Door and Carrier equipment in use at Superior Concrete Products Co., Augusta, Ga.

● Can help you cut your cost per block and improve your quality-uniformity—by stopping costly losses of heat and steam—and preserving uniform temperature and humidity. Two *very* good reasons for you to investigate

UNI-TEMP insulated all-metal DOORS* & UNIVERSAL world-famous DOOR CARRIERS



**Doors also furnished hinge-mounted.*

Let us give you full information about the most efficient kiln closure equipment you've ever seen—at a cost that is probably *much* less then you expect!

Write, wire or phone: **UNIVERSAL DOOR CARRIER, Inc.**
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SEPTIC TANK MOLDS

The concrete tank that is:
—Curved for strength to save you materials and weight.

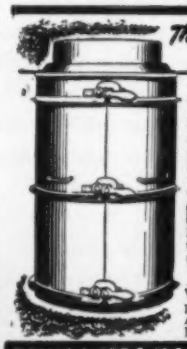
—In one piece to save labor and floor space.

—Designed to meet competition.

Manufacture "State Approved" Septic Tanks. Write for bulletin today.

CONCRETE MACHINERY CO.
DRAWER 60A
HICKORY, NORTH CAROLINA

Manufacturer of the famous **MARVEL JR. Drain Tile Machine**



The "Quinn Standard" FOR CONCRETE PIPE

The Quinn Standard is known as the best the world over, wherever concrete pipe is produced and used. Backed by over 35 years' service in the hands of hundreds of Quinn-educated contractors, municipal departments and pipe manufacturers who know from experience that **Quinn pipe forms** and **Quinn mixing formulas** combine to produce the finest concrete pipe at lowest cost.

QUINN HEAVY DUTY PIPE FORMS

For making pipe by hand methods by either the wet or semi-dry processes. Built to give more years of service—sizes for pipe from "0" up to 120" and larger—tongue and groove or bell end pipe at lowest cost. **WRITE TODAY.** Complete information, prices, and estimates sent on request. Also manufacturers QUINN CONCRETE PIPE MACHINES.

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Low in Cost – Large Capacity

"THE ROCKET"

The Latest Development in Revolving Drum

TRUCK MIXERS

Rugged Construction

●

Separate Engine Drive or Power Take-Off Hydraulic Drive

●

Fast to Charge, Mix and Discharge.

Light in Weight

Has Hydraulic Swing Shute

Illustrated Bulletin on Request

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Phone Flanders 7800

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Serving the CONCRETE INDUSTRY OVER 20 YEARS

WEAR 5 TO 10 TIMES LONGER

because they're job-fitted

for handling concrete block, other abrasive or oily work

Monkey-Grip gloves, with improved brown plastic coating, far outwear ordinary plastic gloves. New pattern has wing thumb and pre-flexed fingers; fits the hand all over; no bagginess; comfortable, easy grip. Choice of styles, fully coated or palm-coated.

for handling bagged cement, other smooth or slippery materials — wet or dry

Grab-it sure-gripping gloves, coated with tough, non-skid natural rubber: Job-fitted for faster, safer load handling. Outwear ordinary canvas or leather by several times. Knit-wrist, safety cuff or gauntlet, fully coated or palm-coated.

Free Test Offer: Employers, send brief description, on business letterhead, of your operation and materials handled. Without charge, we will forward samples of type gloves we recommend, for on-the-job test. Address

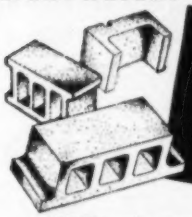
Edmont Manufacturing Company
1208 Walnut Street, Coshocton, Ohio

Edmont JOB-FITTED **GLOVES**

World's largest maker of coated industrial gloves

BESLITE

LIGHTWEIGHT AGGREGATE...



for **BETTER, STRONGER, LIGHTER** concrete products

BESLITE reduces weight, increases sound and heat insulation, resists fire, freezing and thawing, WITHOUT any sacrifice in concrete strength. Lightweight BESLITE concrete cuts building and shipping costs . . . its light color, textured surface gives new beauty to exposed masonry. BESLITE, in two sizes . . . ½" to #4 and minus #4, is available by train, truck or barge within 200 miles of Marietta, Ohio. Made by, sold by, The Marietta Concrete Corporation, leading producer of concrete storage systems for farm and industry.

THE MARIETTA CONCRETE CORPORATION

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MARIETTA, OHIO
Pulaski Hwy. at Race Rd.
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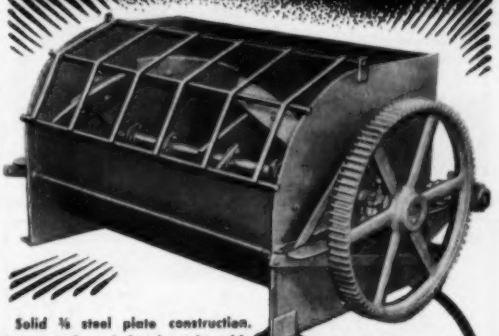
GENERAL MIXER! SAVES YOU MONEY



Solid ⅛ steel plate construction. Heavy end and bowl replaceable liners (Ni-Hard liners available at extra cost). Easily adjusted paddles. Safety screen. Ruggedly designed to take a beating. Shipping weight 2,300 lbs. Also 21 and 30 cu. ft. sizes. Write for free bulletin.

1 BAG 15 CU. FT.

$654.50

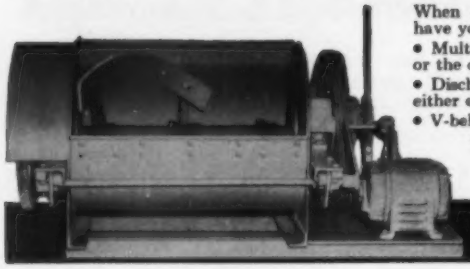
LESS MOTOR • F.O.B PLANT

SHIPPING WEIGHT 2,300 LBS.

GENERAL ENGINES CO.

DEPT. Q-102– 307 HUNTER STREET, GLOUCESTER, NEW JERSEY

only MULTI-MIXER gives you a choice!



When you buy Multi-Mixer you have your choice of:

- Multi-blade paddle arrangement or the conventional spiral blades.
- Discharge door in the rear or either end, controlled front or rear.
- V-belt drive or direct drive motor, and right or left hand drive.
- Special grill guards and dust proof covers.
- Rigid stationary mounting or portable mounting.

All Multi-Mixers are of welded steel construction, in standard sizes from 3 to 60 cu. ft., and larger sizes to your specifications. Ask for Bulletin MM-11. Multiplex also makes fully automatic block machines, skip loaders, and compartment aggregate bins.

MULTIPLEX Machinery Corp • Elmore, Ohio

PREFERRED all over the WORLD

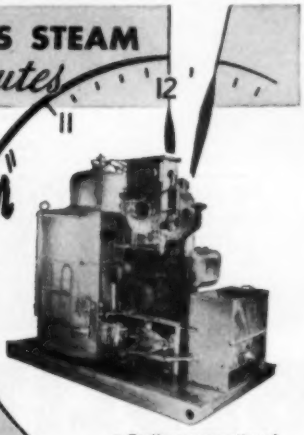
cored steel pallets by "COMMERCIAL"

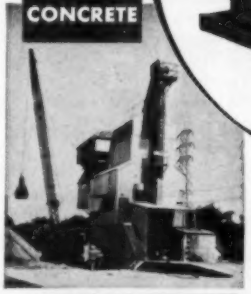
CATALOG AVAILABLE ON REQUEST

THE COMMERCIAL SHEARING AND STAMPING COMPANY
1775 LOGAN AVE. YOUNGSTOWN 1, OHIO

PRODUCES STEAM *in 2 minutes*

LITTLEFORD "Kwik-Steam" VAPOR-CLARKSON GENERATOR ...for READY MIX CONCRETE





• Continuous operation of Ready Mix Concrete Plants is now assured by heating the aggregate and water with a Littleford "Kwik-Steam" Generator. 60° Concrete can be delivered safely in the coldest weather. This "Kwik-Steam" Generator produces steam from a cold start in 2 minutes' time; it gives steam only when steam is needed as the burner cycles off and on automatically. Burning low cost fuel oil, the "Kwik-Steam" Generator is economical in operation, then too, it saves up to 50% in labor as no experienced operator is necessary to run this unit. Made in sizes from 20 to 165 BHP, with either electric motor or gasoline engine. Write for Ready Mix Concrete Bulletin.

LB LITTLEFORD

LITTLEFORD BROS. INC.
402 E. Pearl Street, Cincinnati 2, Ohio

NOW MORE THAN 130 LICENSED MANUFACTURERS Producing

Patented
homeward *Concrete* STEPS

A Small Investment That Pays Big Dividends

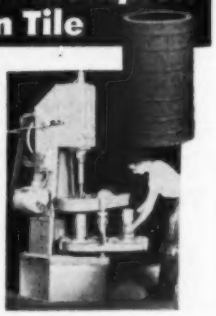
Homeward all metal forms are precision built to produce a product that requires no hand finishing.

The exclusive franchise for your territory may still be open.

For Complete Information Write

ROGER F. WILLIAMS, Licensor
3420 S. W. 9th St. Des Moines (15), Ia.

Make Money with *Champion* Cement Drain Tile



More millions of drain tile are needed to supply ever growing demand. The market is broad and profits are big.

The Champion makes the world's best drain tile. Densely compacted . . . ribbed for extra strength . . . every one truly concentric.

Champion machine is simple, compact and really rugged. Automatic feeder (optional) makes for 1-man operation. Write for literature—gives facts about the business and the equipment.

Concrete Equipment Co.
532 Ottawa Ave., Holland, Mich.

BUY IT ONCE and FORGET IT!

Another first by M & M Engineers—a BURNOUT PROOF Brake Coil for Stearns Magnetic Brakes.

GUARANTEED

Burn out proof. No more down time changing burned out brake coils.
Write, giving coil number and voltage.

M&M ENGINEERING CORP.

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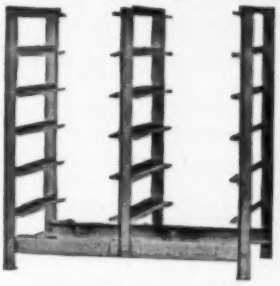
INDIANAPOLIS, IND.

CHASE BLOCK RACKS, CARS, PALLETS

Corrosion-Resistant Hi-Strength Alloy Steel



For Fork or Platform Lift Trucks

CHASE — THE LAST WORD IN
- DURABILITY
- ECONOMY
- EFFICIENCY

Sturdy construction • any style or capacity • Shipped knocked down • Rigid Field connections • assembled Easily

CHASE Foundry & Mfg. Co.
COLUMBUS 7, OHIO

CUT COSTS of crushing cinders and shale!

EAGLE 3-Roll Cinder Crusher
Crushes up to 15 tons of minus ⅜" and up to 50 tons of minus ¾" cinders per hour — handles up to 6" feed size. Large hopper. Enclosed, long-wearing Ni-Hard rolls. Top roll gives preliminary reduction. Spring release protects all the rolls against tramp iron and rock.

EAGLE Shale Crushers
Hooked teeth on double rolls —one slow turning—one fast turning—crush large chunks of shale down to minus 2"—10 to 180 tons per hour, depending on size crusher and material. Also used in tandem for fast two-stage reduction. Cost cutters for all lightweight aggregate plants.

Prevent stained blocks — seal in discoloration with a lime bath in an Eagle Washer!

SINCE 1872 Progress...Service

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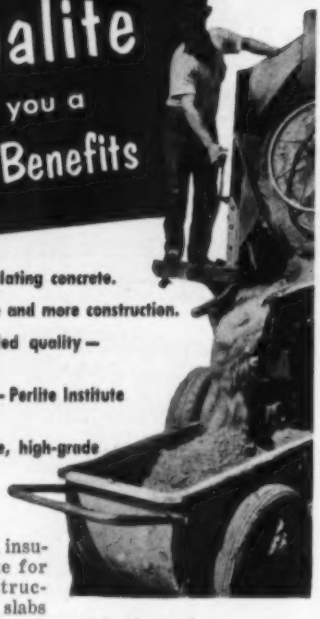
PIT AND QUARRY
431 South Dearborn St. Chicago 5, Illinois

Permalite offers you a Batch of Benefits



- **Lightweight, insulating concrete.**
- **Specified in more and more construction.**
- **Uniform, controlled quality — bag after bag.**
- **"U L" approved — Perlite Institute approved.**
- **A more workable, high-grade ready-mix.**

■ Lightweight, insulating concrete for roof deck construction and floor slabs can mean a big piece of business for you — especially when you use *Permalite* aggregates.

Permalite is top quality, expanded perlite, exactingly graded to proper particle size. In its weight class, concrete with Permalite requires minimum cement-water ratio, has less drying shrinkage, higher strength, less absorption and greater resistance to freezing and thawing.

No wonder lightweight concrete containing Permalite, the *leading* perlite aggregate, is being asked for by ever-growing numbers of architects, builders and contractors.

BETTER PRECAST PRODUCTS, TOO

Concrete with Permalite can be used to produce lightweight, insulating products such as blocks, slabs and panels which can be sawed, nailed and easily handled.

Write us for technical bulletin —
GREAT LAKES CARBON CORPORATION
18 East 48th Street, New York 17, N. Y. Dept. 21-10

Permalite®

THE LEADING PERLITE AGGREGATE

A Building Product of Great Lakes Carbon Corporation and its Exclusive Permalite Licensees

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$ Boost Block and Brick Profits $

with the

APPLEY *Little Giant*

Slump Brick and

Slump Block Machine

Modern, vibration-type machine, featuring interchangeable mold and plain pallet-rack. Makes 6 to 15 slump bricks or blocks per cycle, in many shapes and colors. Lengths of units, 8", 12" and 16". Thicknesses from ⅝" to 4". Units applicable to commercial and residential construction. Write for literature.

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HIGH PRODUCTION
LOW MAINTENANCE

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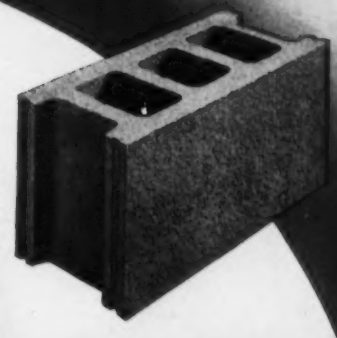
Let's Face the Facts about CONCRETE MASONRY

This Modern Building Material Adds Beauty and Permanence to ANY Type of Structure!



You can build concrete masonry structures in beautiful architectural designs with the assurance they will last a lifetime. Both exterior walls and interior partitions are made in many pleasing patterns by varying the styles and sizes of block. The initial cost is low and the upkeep is nil.

Concrete masonry structures are ARMORED against age, climate, fire, termites, rodents, tornadoes, hurricanes and floods. Interior walls are built with lightweight block composed of cellular aggregate which provides proper acoustics and reduces noise transmission through walls. Lightweight block are also used as a back-up material for exterior walls providing insulation against heat and cold. Wall dryness provides good health and sanitary conditions. Restful quiet is assured by sound conditioning between rooms and floors.

CHURCHES find concrete masonry construction both practical and economical.

CONCRETE PRODUCTS PLANTS:
This advertisement is one of a series prepared by Besser and scheduled to appear in American Builder, Practical Builder, Masonry Building and Engineering News Record. We trust these advertisements will help you in developing new markets for concrete masonry — the modern building material.

BESSER MANUFACTURING CO.
Alpena, Michigan, U. S. A.

...with Power Off-bearing Hoist. ...ize 7⅝" x 7⅝" x 15⅝" modu... at a time on one Plain Pallet. ...aller units made in larger multiples on the same pallets. Fully automatic. Operator merely guides the hoist.

HOSPITALS are constructed with block w... floors to promote health and safety.

PUBLIC BUILDINGS throughout the world use millions of concrete masonry units.

HOMES, both large and small, are built of block for firesafety, beauty and permanence.

COM... ...utilize various ... their building.

BESSER

BATCH MIXERS | SKIP LOADERS | BLOCK & BRICK CUBERS | SUPER VIBRAPAC | SINTERING PLANTS | ACROW CENTERS | ROOF TILE MACHINE

A-7077-1PB-CR

Reading Railroad Co. Bridge, Glenside, Pa. Engr.—Reading Co.; Contr.—Bates & Rogers, Chicago; Pozzolith Ready-Mixed Concrete supplied by Reading Ready Mix Co.

POZZOLITH BETTER CONCRETE In Reading Railroad Bridge

Better performance *during* construction . . . better performance *after* the job is completed . . . is standard with Pozzolith Concrete and accounts for its wide use in such important structures as this Reading Railroad Co. half million dollar belt line bridge.

CONSTRUCTION advantages of Pozzolith Concrete include — easy placeability, good cohesiveness, reduced bleeding, designed strength, good bond of concrete to steel, reduced shrinkage and minimum finishing.

SERVICE advantages are — good appearance, low permeability, minimum volume change, great durability, and maintenance economy.

POZZOLITH provides these benefits — *at lower cost than by any other means* — because it disperses cement, reduces water and entrains the optimum amount of air. *Full information and literature on request.*

Over 600 Leading Ready-Mixed Plants are now equipped with the POZZOLITH AUTOMATIC DISPENSER

WHY?

Because a producer can, at lower cost:

1. Produce concrete of low permeability . . . with normal Portland cement.
2. Produce high-early strength concrete . . . with normal Portland cement.
3. Produce air entrained concrete without strength loss . . . with normal Portland cement.
4. Produce all of the above properties out of one cement bin . . . with normal Portland cement — stepping up production, reducing inconvenience in handling and cutting costs.

•

In normal mixes, concrete of any given durability, strength and workability, is produced more economically with Pozzolith than by any other means.

Over 600 Leading Ready-Mix Plants
Are Producing Pozzolith Ready-Mixed Concrete

(Names Of Your Nearby Producers Supplied Upon Request)

the MASTER BUILDERS Co.

CLEVELAND 3, OHIO — Subsidiary of American-Marietta Company — TORONTO, ONTARIO

AUCTION

COWELL PORTLAND CEMENT CO.

COWELL (25 MILES FROM SAN FRANCISCO), CALIF.

$12,000,000.00 VALUATION

TUBE MILLS	SCALPER SCREENS	POWER SHOVELS
BALL MILLS	HUMMER SCREENS	BUCKET ELEVATORS
WELL DRILLS	TRIPPERS	SCREW ELEVATORS
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Starting Each Day at 10 AM

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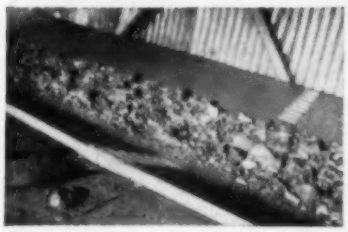
BROADCAST SECTION

for effective disposal of your used equipment

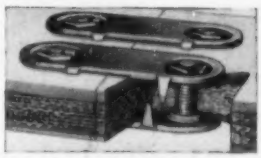
FLEXCO®

BELT FASTENERS and RIP PLATES



FOR HEAVY CONVEYOR AND ELEVATOR BELTS OF ANY WIDTH

★ FLEXCO Fasteners make tight butt joints of great strength and durability.
★ Trough naturally, operate smoothly through take-up pulleys.
★ Distribute pull or tension uniformly.
★ Made of Steel, Monel, Stainless, Everdur. Also Promal top plates.



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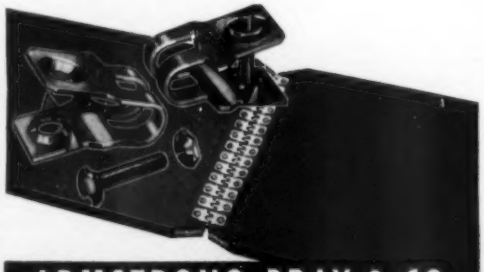

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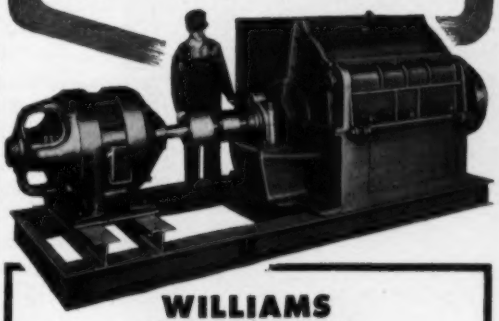

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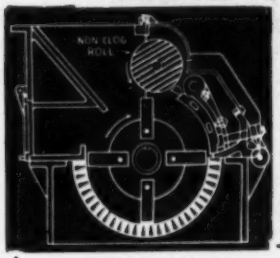

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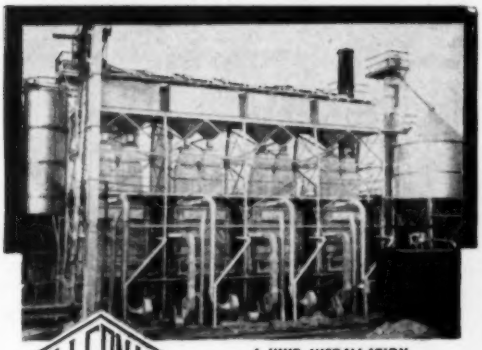

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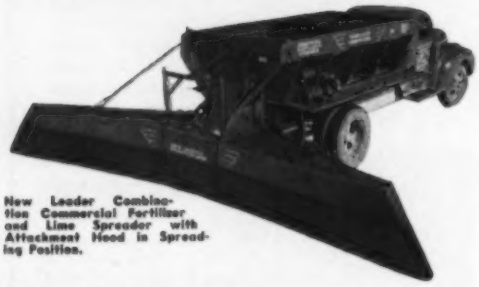

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We are more interested in a man's personal characteristics and aggressiveness than the specific work which he has performed in the past or his educational background.

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with about a 7½ H.P. electric motor.

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Electric carpuller, 15 hp.
Double Drum Tandem Hoist
Three electric overhead hoists
Chicago Size 12, 3 ton air hoist
Sullivan HE single drum 7½ hp. electric hoist
Stimmel winches, 1½ hp. 110 volts
Stone crushers, pulverizers, mills

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136 Colt Street, Irvington, New Jersey

FOR SALE

COMPLETE ALLIS-CHALMERS ROD MILL UNIT

1—4' x 6' Peripheral Discharge dry grinding rod mill with 1½ H.P., 3/60/440 volt Gear Motor and Starter for Feeder.
1—40 H.P. Texrope Drive, 10.9 P.D. 9 "C" Groove motor sheave, 40.0 P.D. 9 "C" groove rod mill sheave with 9—C-180 Texropes.
2—4' x 6' Utah totally enclosed single deck electric vibrating screens with power limit for 60 cycle, single phase, 440 volt operation with screen cloth.
2—Additions for sub-deck with four mesh regular steel of .063" diameter wire, backing cloth, clamping plates, bolts, etc.
2—Automatic non-blinding devices for screens.
1—New spur gear for Rod Mill, 102 teeth.
1—40 H.P. Westinghouse motor 575 RPM Full load, 3/60/440 volts, drive for the Rod Mill.

This unit is still in operation and will be taken out of service due to a change in production methods.

ALSO

Parts in excellent condition for Allis-Chalmers 10-K Gyratory Crusher as follows:

1—Mainshaft assembled with head center, manganese steel mantle and head nut.
1—Mainshaft assembled with head center, Stroh steel mantle and head nut.
1—Eccentric (not babbitted) without gear.
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1—Spider, cast steel.
1—Drive shaft with pinion.
1—Spider cap.

Box No. W-5, c/o Pit & Quarry Publications
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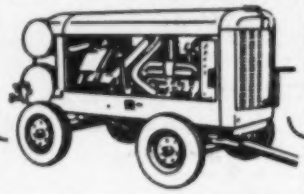

THIS MONTH'S SPECIALS

AIR COMPRESSORS
Portable 2-Stage

1—500 cu. ft. Ing. Rand #40-T-29021, Mdl. K-500, 100# pressure, 6 cyl. Wauk.-Hesselman Diesel engine, 4 pneu. tires. Wt. 10,000#.
2—210 cu. ft. Sullivan, Sers. 22115, 22277, 4 cyl. Buda gas eng., on steel wheels & pneu. tires. Bargain.
2—315" Ing. Rand, Mdl. 315A, one with Waukesha gas eng., other Wauk.-Hesselman Diesel eng.

CAR PULLER

1—Mead Morrison #952, 7½ HP 3/60/220 motor to handle 1 to 5 loaded cars.

CRANES, LOCOMOTIVE

1—25 ton Industrial Brownhoist Type G, 40-50-60' boom, Nat'l. Board Boiler 150#.

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1—85 HP single drum Mundy gas hoist #15715, silent chain drive & side lever operation. Cap. 9000# @ 225 FPM. Wt. 7000#.
2—40 HP 2/drum O&S gas hoists, cap. 4300# @ 220 FPM. With or w/o attached swingers.

WE HAVE A LARGE SUPPLY OF HOISTS — ELECTRIC, GASOLINE, STEAM AND DIESEL, ALL SIZES.

LOCOMOTIVE, 15 TON, STD. GA.

1—15 ton Vulcan Std. Ga. Locomotive, Ser. 3903, power 6 cyl. Mdl. JMS LeRoi gas eng. Wt. 30,000#. $2,500 in its present condition.

PUMPS

1—New 3" suction 2" discharge Dayton Dowd (Peerless) 15 HP 3/60/220/440, 80 GPM @ 300', 140 GPM @ 210', 220 GPM @ 100'.

WE HAVE A LARGE STOCK OF PUMPS OF ALL TYPES AVAILABLE FOR IMMEDIATE SHIPMENT.

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EQUIPMENT CORPORATION OF AMERICA

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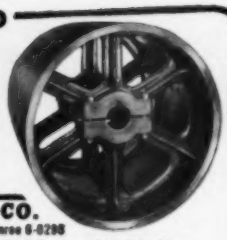
special and standard sizes— 2" to 102" diameter



On special size pulleys and sheaves from 2" to 102" diameter, in practically any desired hub, spoke, face width or rim design . . . in any quantity . . . Pyott delivers quickly and reduces costs. Your rough sketch, plus accurate dimensions, starts production. Write for the Pyott folder on SPECIAL SIZE CASTINGS.

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1—20,000# Allis-Chalmers, Dbl Drum
1—26,000# Nordberg, Sgl Drum
1—26,000# Vulcan, Sgl Drum AC with MG Set Complete
1—11,000# Wellman, Sgl Drum AC
1—16,000# Allis-Chalmers, Sgl Drum
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CARPULLERS AND LOADERS
1— 5,000# Jaffray Carspotter AC
1— 4,000# Brownie Carspotter AC
1— 5,000# Link-Belt Carspotter AC
1—20,000# Amer. Hoist Carspotter AC
1—20,000# LB Endless Puller

CRUSHERS & MISC.
1—36x36 Jeffrey Sgl Roll
1—12x16 Eagle Dbl Roll
1—18x20 Eagle Dbl Roll
1—420'x20" SA Comb. Scraper & Bucket Conveyor or w/o M/T'r. Ideal for tipple or dock.
2—24'x60' SA ports. conveyors, AC m/r
1—(New) NOLAN Porta. feeder
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1—3 yd. Sauerman Scraper Bucket System
1—75'x28'x30' high Steel Building

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P&H Model 855B 2-yd. shovel—Dragline combination — excellent condition

Cedar Rapids 25x40 portable Primary Crusher w/D13000 cat. power — a complete unit — excellent condition

Cedar Rapids 10x36 crusher portable scalping unit w/D8800 cat. power—a complete unit—excellent condition

Ingersoll-Rand HK-500 air compressor mounted on 6x6 Truck — good condition

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2—500 cu. ft. C-P Diesel Compressors
1—25-Ton Link Belt HC-90 Truck Crane 120' Boom
1—20-Ton Bay City Truck Crane, 80' Boom, 15' Jib
1—20-Ton Northwest Truck Crane
1—¾ Yd. Bay City Diesel Crane
1—2 Yd. Koehring 803 Crane
2—1¼ Yd. Bay City Crane or Shovel, Diesel
1—¾ Yd. Lima 34 Shovel, Diesel
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1—30-Ton Whitcomb Diesel Elec. Locomotive
1—44-Ton G. E. Diesel Elec. Locomotive
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1—Northwest 25 Shovel Attachment
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1—New 45' Boom & 16' Jib for Link Belt 85 or 90

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Switch Material
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1—Traylor #8 Gyratory Crusher
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New York Trap Rock Corporation
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MU 9-8500-8508

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3 Steel Water Tanks, 6900 gal., 5500 gal., 4500 gal.

1 Pump, 4P Jaeger, Self-Priming, Centrifugal, Hercules Engine 1XB, mounted on 2 steel wheels

1 Motor, Gasoline, 35 HP Buda, Complete with Clutch

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1—New Acme 16" x 5' heavy duty reciprocating feeder—stock delivery.

1—Factory rebuilt Acme 18 x 32 Jaw crusher.

ACME ROAD MACHINERY COMPANY
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FOR SALE

65 Ton G.E. Diesel Elec. Loco.
7 Cat. DW10 Tractor-Wagons
30 Ton Amer. Steel Stiffleg Derrick
130 HP Christian 2d Diesel Hoist
30 Ton Ind. Bh. Gas Loco. Crane
30 Ton Davenport Diesel Loco.
1050 ft. I-R Air Compressor. New '49
48" Telsmith Gyrasphere Crusher
556 KW F-M Diesel Generator Set
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Jaw Crushers 36" x 48" Nordberg—36" x 48" Farrel—60" x 48"—42" x 40"—42" x 30"—24" x 36"—18" x 36"—15" x 30" Symons Cone 5½'—4'—3'—2'—36 x 46 Dixie hammer mill—54" Traylor Type "B"—42" McCully—48" Gyrospheres.

Shovels—Roll Crushers—Rod Mills—Ball Mills—Rotary Kilns—Dryers—Log Washers—Classifiers—Mine Hoists—Transformers—Motors—Gravel Plants—Blast Hole Drills—27T-29T-42T Generator Sets—Drag Lines.

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40' x 12' Steel Boat
10" Amsco Pump
V-Rope Drive Powered by
2—120 HP Cummins Diesels
in Tandam
12" x 25' Suction
100'—10"Pipe
8—Pipe Pontoons
Motors in good condition.
Parts to make practically new pump.
Dredge used in sand deposit located on railroad near Cowles, Nebraska.
Sale Price — $10,000
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Profitable, going limestone crushing business for sale. Excellent supply, high grade stone available. Midwest Location.

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1—1¼ yd. Sauerman slackline, complete. This outfit consists of bucket, hoist, 100' mast, roller bearing blocks and carriage, trackline and guys.

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One Gates, Style D Crusher, No. 6-K-6375.

Parts for same:

One Set Concaves	New
One Set Mantles	Good
One Used Excentric	Good
One Pinion	New
One Brass Wearing Ring	New
One Set Long Excentric Bolts	

One Gates, Style D Crusher, No. 8-L-4898.

Parts for same:

One Extra Shaft	Good
One Head (Smooth)	New
One Set Concaves	New
One Used Excentric	Good
One Pinion	New
One Extra Drive Shaft & Pinion	Good
One Set Mantles	Good
One Set Long Excentric Bolts	
One Excentric Gear	New

We offer the No. 6-K-6375 for $4500.00 and the No. 8-L-4898 for $7500.00, (all spare parts included) f.o.b. cars or truck, our plant, Cape Girardeau, Missouri. Subject to prior sale & delivery can be made after January 1st, 1953.

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3—#5047 Raymond High Side, 4 rolls, one mill equipped with "whizzer" type air classifier and oil journals; mills equipped with Raymond exhausters, cyclones and inter-connecting piping, two 50 HP 3/60/2200 V motors with each of two mills.

6—No. 1, #0, 00, 000 Raymond.

3—#0, 00, and 8" Raymond Screen Mills.

4—Mikro #2SI, 2 TH, 4 TH

CRUSHERS:

Jaw:—12 x 20" Birdsboro all steel; 2" x 6", 6" x 15" Sturtevant; 18" x 36" and 24" x 36" Farrel; 42" x 48" Traylor; 48" x 60" Traylor.

Rolls: 42" x 16" Allis Chalmers Type B; 24" x 32" Penna. single roll.

Portable Plants: Cedar Rapids 1036—BBB; 2540—AAAA, 2036—AAA, also Pioneer with 30" x 42" primary and secondary crushers, all Diesel driven.

BALL AND TUBE MILLS:

4—Tube Grinding Mills, made by Traylor E. & M. Co.; Allantown, Pa. Silex lined, 4' x 13', 4'6" x 18'6", 5' x 22' and 5' x 20'; also two 5'6" x 20' iron lined, with motors.

1—4'6" x 7' Allis-Chalmers Ball Granulator. Used 100 hours.

8—Pebble Mills, porcelain lined; 3—6' dia. 8', 800 gals. each.

1—6' x 5'; 3—5' x 4'. each with ball charge.

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3—6' x 60' Vulcan Iron Works, complete; each with or without 3' x 50' Rotary Cooler. By installing lifting flights these kilns would make excellent heavy duty dryers.

1—7' x 45' Link Belt Kiln, complete; 7'6" x 125'; 1—8' x 135' Allis-Chalmers.

ROTARY DRYERS:

4—Ruggles-Coles Direct Heat—Class XF4—54" x 25', two Class XF—5' x 40'. Also L-B 2'7" x 10' Roto Louvre; three 3' x 50'; 5' x 30', 5' x 50', 6' x 40', 6' x 60', 7' x 70'.

4—6' x 50' Louisville Rotary Steam Tube.

VIBRATING SCREENS:

3—Selectro 3' x 6' 2-deck, 1—3' x 6' 1-deck, all totally enclosed, heavy duty.

1—3' x 6' Colorado Iron Works. 1-deck.

1—4' x 8' Tyler Niagara, 3 decks.

8—Tyler Hummer, 3' x 5', 4' x 5', 4' x 10'. Also #38 4' x 10'.

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2—Raymond 6' and 16' dia., 1—8' Gayco; 1—16' Sturtevant.

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2—Two stage Washing Classifiers, each with two rakes in tandem, in steel trough 26' x 6" long x 3' wide, with drives.

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Also Shovels, Cranes, Draglines; Jaw Gyratory and other crushers; Symons and Telsmith Cones; Complete Portable Crushing Plants; Rotary Kilns and Coolers; Air Compressor; Conveyors, etc.

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Raymond #1 w/conveyor & cyclone.
24" x 18" Jeffrey A2.
14" x 40" Two-roll Traylor.
18" x 36" Jaw, Traylor, Bulldog.
48" Symons, vert., disc.
Raymond, 4-roll.
Size 1, Allis-Chalmers.

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10'x90'x9/16" Allis-Chalmers.
8'x80'x¾" Vulcan.
8'x54'x¾".
7'x125'x½".
7'x60'x¾" with lifters.
7'x60'x½".
7'x48'x½".
6'x40'x⅜".
6'x14'x9/16".
5'x67'x5/16" with lifters.
5'6"x25'x9/16" Allis-Chalmers
4'8"x40'x¼".
4'x35'x½" with burner.
3'x20'x¼".

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5'x22' Smidth, Tube.
23"x12' double shaft, L. B. Pug.
10'x48" Hardinge.

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5" Fuller Kinyon Pump.
Magnetic Belts.
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36"x34' Apron Conveyor.

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6—Rotary Dryers 10'x90', 7'x120', 7'x60', 5'x67', 4½'x50', 4'6"x40'.
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8—Tyler Hummer Screens 3'x15', 3'x10', 4'x7', 3'x5'.
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2—Sturtevant 30"x16", 30"x12" Double Roll Crushers.
1—Steel Bin 15'x25'x9' deep.
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Bucyrus-Erie Model 10B shovel
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TD-14 Int. w/dozer
Ingersoll-Rand H K 500 compressor on truck
Ingersoll-Rand H K 500 compressor on truck
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2—2540 Cedar Rapids portable primary crushers w/power
1036 Cedar Rapids crusher-scalping unit w/power
4033 Cedar Rapids Hammermill
4033 Cedar Rapids Hammermill
3033 Cedar Rapids Hammermill
12x36 Cedar Rapids Twin Action Jaw Crusher
2—8x18 Cedar Rapids 2-compartment bins
3—4x12 Cedar Rapids 2-deck screens
540'—30" channel conveyor
580'—24" channel conveyor
15—American speed reducers sizes 3, 4 & 5
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Carver 6" water pump
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Worthington 2½" water pump—electric
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1—35 ft. Enclosed Bucket Elevator
1—40 & 25 Ton Material Bins ¼"
12—300 & 400 Amp. Elec. & Gas Welders
1—18x26 C. R. Jaw Crusher—Excellent
1—¾ Yd. Diesel Comb. Crane—1951
8—50 HP slip rg. motors 514-600-720 RPM
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Also frogs, switches, spikes, bolts, and all class of track accessories available.

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20—36 Ball Bearing Universal Jaw Crusher
10—24 Ball Bearing Universal Jaw Crusher
9—36 Ball Bearing Telsmith Jaw Crusher
10—36 Ball Bearing Telsmith Jaw Crusher
14 x 26 Acme Cone Crusher
5' Symns Cone Crusher
75—100—200 H.P. Motors
16" x 16" New Holland Rolls
18" x 30" Universal Roll Crusher
75-B Shovel Front with new amco manganese rock bucket with ball practically new.
½ yd. General Shovel and Crane on rubber, 1946
36" x 12' Telsmith Feeder

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Blue Ball, Pa.

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1—Austin-Western 10x20 R.B. Crusher with 24' bucket elevator, IHC 22x36 rubber-tired Tractor with Pulley, 40' x 18" Portable Conveyor. 2' x 8' Single Deck Screen. ..$2,700.00

1—Marion ¾ Yard. Model M-55 Heavy Duty Dragline Crane. G.M.C. Diesel Motor, 50' Boom, Air Controls, 30" tracks, Kiestler 1½ Yard Coal-handling Bucket. Machine in excellent condition.

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ROCK ISLAND, ILLINOIS

FOR SALE SAND DREDGE

includes
10" Amsco Sand Pump with 12" Suction Line.
250 H.P. 2300 volt Motor and Starter.
Miscellaneous fittings and equipment to make a complete unit mounted on structural base supported on 11 steel pontoons.

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Complete and operating Limestone products plant located in Austin, Texas area. Two high purity quarries, dolomite and limestone, crushers, Ellernan Kiln Hydrator—burnt material storage, sacker, car loader, warehouse. All quarrying and transportation equipment, ample gas, water, electricity. Located on railroad and highway. Complete technical data. **Address inquiries to P. O. Box 935, Austin, Texas.**

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Motors and Generators, A.C. and D.C. for sale at attractive prices. New and Rebuilt. All fully Guaranteed. Send us your inquiries.

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One ME650 Murphy Diesel Generator set. 109 KW, 440 Volt, 3 phase, 60 cycle. Excellent condition—bargain price.

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Locomotives — Diesel — Gas — Fireless
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1—16V PIONEER PORTABLE, 350 TON CAP.
1—36" x 42" AUSTIN WESTERN PRIMARY DIESEL.
1—10" x 36" WOOD SECONDARY DIESEL.
1—15" x 36" DIAMOND PRIMARY & SECONDARY.
1—15" x 36" FARREL ELEC. & 24" x 120' CONVEYOR.

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FOR SALE

2—Steel Stiff Leg Derricks, 30-ton, 75' Boom, American.
2—Hoisting Engines, 3-Drum, with 100 H.P. Gas Engines, Lambert.
2—Independent Swingers.

Construction & Power Machinery, Inc.
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5 HOISTING ENGINES

1—A. H. & D. 2 DRUM 60 H.P. ELEC.
1—A. H. & D. 3 DRUM 75 H.P. GAS
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FOR SALE

2 Ingersoll-Rand air compressors with oil engine, Type PO, 55 H.P., size 15, class V2. Located New York State.

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New Husky Grader, 8' Reinforced Digging Blade, Front End Control, mounted on 4 Rubber Tired Wheels. (5:50 x 16 fronts; 7:50 x 18 rear).....$650.00

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1—Lorain TL-20 ½ yd. shovel
1—Byers ½ yd. shovel
1—HD5 dozer
1—UD 24 International diesel engine
1—UD 14A Internatianal diesel engine
1—3'x10' 3-deck Seco vibrating screen
1—3xD Gruendler pulverizer, 36" center feed
1—30" Gruendler apron feeder
1—18"x36" Universal jaw crusher
1—85'x24" conveyor
1—35'x18" conveyor
1—Joy wagon drill
1—210 cfm Chicago Pneumatic compressor
2—Ford trucks
2—Reo trucks
1—International truck
1—¾ ton Dodge pickup
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$7,000 in stock piles
Buildings, scales, tools, electric motors (4)

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Rock meets Missouri State Highway specs and plant now working on unfinished highway contract.

The above to be included with rock lease.

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1—90 ft. I-R Single Stage 4 Solid R.T. wheels	$250.00 ea.
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2—210 ft. G-D Single Stage 4 Solid R.T. wheels	450.00 ea.
2—210 ft. Schramm Single Stage 4 Solid R.T. wheels	700.00 ea.
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MAHONEY-CLARKE, INC.
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10" Hydraulic Dredge Sand Plant
Log Washers: Eagle 7x30', Link Belt 24"x18'
CRUSHERS: 10x20 AW, 13x36 Diamond, 18x24 Univ., 20x36 Cedar Rapids, 24x36 Farrell, 30x36 Traylor, & 48x36 Farrell JAW. #25 Kennedy 10B & 13B Telsmith, 4' Traylor TY GYR. 24x16, 36x16 & 54x24 DBL. ROLL. 2' Symons CONE.
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MILLS: Williams 4 & 5, Gruendler 2 & 3 XB Hammer, Raymond 5 & 4 Roll, 6x6 & 6x8' Ball, NW2, 25, 6 & 8, Link Belt K370, Lorain 95, Monighan 3T & P&H 1055 DRAGLINES, 30"x8', 3x14' & 40"x6' Apron Feeders
SHOVELS: Link Belt LS75, Buckeye 70, 1 yd. Byers NW6, Lorain 77 & 79, Lima 604, Bucyrus 54B NW78 & 80D, Lima 1201, Bucyrus 80B Elec. 400HP GE Slip Ring Motor 390 RPM, 440 V.

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22½ ton Browning #8 steam locomotive crane, 50' boom.

70 ton Baldwin steam switching locomotive

40 ton Shaw Overhead bridge crane 35' span

20 ton Shaw Overhead bridge crane 35' span

210' long outdoor "A" frame craneway with 24" runway beams.

Heavy craneway beams 18 pieces 27' long 24" wide flange 160# sections.

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MINE HOISTS: 150 H.P., 6'6" dia., 6'8" face; 250 H.P., 72" dia., 48" face; 200 H.P., double drums, one clutched, 8' dia., 4' face. All 3 phase, 60 cycle, 2200 volt with control equipment. Head Frame for double shaft 16'9" x 17'2", height 55', with or without 8' dia., sheaves for 1⅛" rope. Other Hoists 100 H.P. to 1050 H.P., single and double drum with electric equipment.
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CRANES: Overhead Electric Traveling Cranes, 6½ ton, 80 ft. span, 4 motor, bucket handling with clamshell buckets, 440 volt, 3 phase, 60 cycle. One available now; one in January, 1953.
AIR SEPARATOR: 1—Bradley 16 ft. with or without 100 H.P. 440 volt motor, 880 RPM, type C1, variable speed, 3 phase, 60 cycle; Wound Rotor 300 volts, 222 amps.
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HAMMERMILL: Cedar Rapids Universal, 36" x 41", portable, with G.M. Diesel Motor, Apron Feeder, discharge conveyor, etc. Condition like NEW.
CLASSIFIERS: 4—Akins and Wemco 54" and 78", single screw, double pitch, weir type, 220/440 volt motors, all in new condition. Three of the above located near Reno, Nevada. 1—Dorr 8' x 39' rake, with 22' bowl. New condition.
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BELT BUCKET ELEVATORS WITH 4 x 6 BUCKETS:
1—Elevator, steel case—34'6"high
1—Elevator, wood case—20' high
1—Elevator, wood case—16' high

RUBBER COVERED BELT CONVEYORS:
1—18" Belt Conveyor— 60' long
1—27" Belt Conveyor— 76' long
1—30" Belt Conveyor—12'6" long
1—30" Belt Conveyor—144' long

NINE INCH SECTIONAL SCREW CONVEYORS WITH STEEL CASE—three 16' long, one 20' long, and one 12' long.

1—LINK BELT DOUBLE CHAIN DRAG CONVEYOR—140' long with 3/16" bent steel drag plates 8" x 24".

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1—HEAVY DUTY, SOLID BRONZE, DRAG CHAIN CONVEYOR—31' long, with 8" pitch chain.

1—LINK BELT #0340, PINTLE CHAIN CONVEYOR—51' long, with angle drags.

1—LINK BELT #0340, PINTLE CHAIN CONVEYOR—51' long, with angle drags.

1—LINK BELT DRAG CONVEYOR—Class—808-809, steel chain with Bronze bushings—68' long.

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1—HEAVY DUTY JEFFREY DOUBLE CHAIN—#526-C, DRAG CONVEYOR—156' long.

The above equipment is for immediate delivery
Priced to Sell
Subject to Prior Sale
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DIESEL: 105, 315, 450, 500, 600, 907 & 1000 Ft.

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6—Elec. Shovels, 1½, 1¾, 2, 2½ & 4 Yd.
4—Walker Draglines, 1-2-3-4 Yd.
3—25 & 40 Ton 120 Ft. Boom Whirleys.
2—7 Ton Cranes 50, 150 & 40 Ton Diesel & Steam.
9—Diesel Shovels & Cranes 1 to 5 Yd.

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46—KOPPEL, 1½ Yd., 24 & 30 & 36 & 42 In. Ga., V Shaped.
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60—8d. Ga. 12 Yd., 16 Yd., 20 Yd. & 30 Yd. Cap.
6—10 ton Phoenix Quarry cars-std. gg.

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5'x22", 6'x22", 6'x48", 6'x22", 6'x36" & 10'x36" Hardinge Conical Ball Mills.
3'x22', 4'x22', 5'x24', 6'x48', 6'x8' & 7'x8' Cylindrical Ball Mills, Marcy, Allis Chalmers, etc.
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2—5'x22' Mixo Lined Tube Mills.
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Bradley Hercules Junior.
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4 & 5 T.P.H. Continuous Dustless Hydrators.
3 Clyde Batch

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Loomis 44, Keystone 81 & 71
10—IR—7W3—Wagon Drills

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Blake Type—9x15, 10x20, 12x24, 13x24, 13x30, 15x30, 15x36, 24x36, 30x42, 40x48, 50x42, 84x60, 42x48 & 52x36
Single Shaft Type—10x16, 10x18, 11x18, 9x36, 10x30, 11x24, 15x30, 10x36, 18x36, 20x36, 24x36, 10x40, 30x42
Cone & Roller Type—7x10, 9x30, 10x16, 10x30, 10x36, 11x15, 13x15, 13x22, 13x24, 13x26, 11x36, 11x36, 14x36, 14x36, 13x40, 18x36, 18x50, 9x40, 24x40, 32x50

REDUCTION TYPE CONE CRUSHERS

Allis Chalmers 8328 Newhouse 5', 7' & 10'
Symons 2', 3', 4', 5½', 6½', 7' Short Head 7'6in. Gyro
24", 36" & 3' Short Head
Traylor 7' & 9'6" TY No. 12 RR, 30", 48" TS
Kennedy 12-D, 22-D, 27-D, 40-D

PRIMARY TYPE GYRATORY CRUSHERS

Allis Chalmers 8328 No. 3, 4, 5, 6, 7½, 8, 9, 12
Superior McCully 16", 30" & 42"
Austin No. 3, 4, 10S, 10T, 8
Traylor Bulldog 12", 14", 16", 20", Tels. 10B, 12B

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GUY: 8 Ton 80 Ft. Boom, 12 Ton 100 Ft. Boom, 20 Ton 110 Ft. Boom, 50 Ton 100 Ft. Boom.
STIFF LEG: 5 Ton 70 Ft. Boom, 15 Ton 100 Ft. Boom, 80 Ton 100 Ft. Boom, 75 Ton 125 Ft. Boom.

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15—6000, 10000 and 20000 gal. cap. with coils.

RAILROAD CARS

100—8000 & 10,000 gal. cap. Tank Cars.
100—50 Ton & 70 Ton Battleship Gondolas.
60—50 Ton Cap. Flat Cars.
10—Side Dump covered, 70 ton Hopper Cars.

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DIESEL: 15, 20, 45, 48 & 100 Ton.
GASOLINE: 3 Ton, 5 Ton, 8 Ton, 15, 14 & 20 Ton.
STEAM: 8 Ton, 12 Ton, 40 Ton & 70 Ton.
ELECTRIC: 3 Ton, 5 Ton, 8 Ton, 17 Ton & 40 Ton.

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JEFFREY 24 x 18 A, 36 x 24 & 36 x 42 B
WILLIAMS No. 1A RAJAH, 1B OGA
GRUENDLER 2-XD — 3-XD & 4-XC
DIXIE—5040 MODEL 3424, 5050 & 5060 PREMIER
PENNSYLVANIA CA-3-38 Impactor and SXT-11 & 15

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60"x35' Ruggles Coles XB Indirect.
Double Shell 48"x30', 70"x35'
Direct Heat: 4'x20', 4'x40', 4½'x40', 5'x24', 5'x30', 5'x35', 6'x35', 6'x50', 8'x50', & 10"x60'
Kilns: 6'x45', 7'x60', 8'x60' & 9'x170'

CONVEYOR BELTS

6000 Ft. 36, 42, 48 & 60 In. Wide

SCREENS

VIBRATING: 3x8, 3x21, 3x25, 4x8, 4x10, 4x16, HUMMER, NIAGARA & ROBINS, LINK BELT.

DIESEL GENERATORS

4—100 KW G.M. 3/60/220/440 V.
3—60 KW International 3/60/220 V.
2—50 KW Superior 3/60/220 V.
3—74 KW Caterpillar 3/60/220/440 V.
1—100 KVA Baldwin DeLaverne 3/60/440 V.
1—New 600 KW American 3/60/460 V.
1—300 KW Gen. Elec. 3/60/2300 V.
1—1000 KW G. E. 3/60/2400 V.
1—438 KVA Worthington 3/60/2300 V.
6—250 Volt Direct Current 50 to 500 KW
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1—600 KW Gen. Motors $2500
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3 yd. Dumpcrete
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These machines reconditioned in our newly-built daylight plant. Come see them!

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Butler Complete Concrete Batching Plant, New Condition, 250-Ton, 4-Compartment, 3-Yard Batcher, Air Boiler, Cement Capacity 950 Bbls., Aggregate & Cement Elevators
4—4½ Cu. Yd. Smith Truck Mixers, KB8F International Trucks, 1949
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Mixers and Trucks in excellent condition, priced to sell.

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Lot—6" Speedlay Pipe with Couplings.
Lot—Flexible Steel Hose, 6" diam. also 5-Ply Rubber Hose 5" diam.

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Consisting of —
3—McIntosh & Seymour Diesel Engines Type 6B32S, 660 HP, 300 RPM.
3—General Electric Generators Type ATI 24-563-300 Form A, 2300 Volt, 3-phase, 60-cycle, 625 KVA maximum. (500 KW at 80% Power factor)
3—Direct Connected exciters
1—GE main switch-board
Plus transformers, panels, etc. making up complete plant.

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JAW CRUSHERS—7" x 12" up to 36" x 48"
CRUSHING ROLLS—16" x 10" up to 54" x 24".
GYRATORY CRUSHERS—#3 up to #13. Also one 12" Superior McCully gyratory crusher.
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1—600 bbl. Cement Plant
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Used Crushing Equipment
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Prices very attractive
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6—TRUCKS WITH MOTORS FOR WHITCOMB 65 TON DIESEL-ELECTRIC — LIKE NEW — BARGAINS

WHITCOMB 50 TON STD. GA. DIESEL-ELECTRIC—TYPE 0-4-0—EXCELLENT—BARGAIN

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21—15 Ton Hopper—36" Ga.
2—50 Ton Hopper Cars—Excellent.
25—Std. Ga.—4 Yd.—Quarry Cars. Heavy Duty.
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Guaranteed Equipment

Immediate shipment from stock.

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CINDER, PUMICE, PERLITE CRUSHERS

10 to 20 tons per hour capacity $ 479.00
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Complete with hopper.

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Eccentric weight types. Several in stock from 2' to 4' to 3½' x 8'.
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Complete with motor and drive.
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20 Ton Truck Scales $617.00
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Others to 50 ton capacity. All scales complete with structural steel weighbridge. Parts and weighing beams for most makes of motor truck scales.

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14" belt	$16.50	24" belt	$18.75
16" belt	17.25	30" belt	19.50
18" belt	18.00	36" belt	20.25
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1-roll Return Idlers for these sizes:

14" belt	$4.38	30" belt	$5.25
16" belt	4.75	36" belt	6.75
24" belt	7.50	42" belt	9.50
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ALL WELDED STEEL PULLEYS

Head Pulleys in frame from.....$154.00
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4. Replaceable cast alloy steel corner shoes are heat-treated and hard-surfaced to provide a flint-like facing.
5. Bulldozer blade assembly is solid welded without pin connection, giving the front-end single unit stability.

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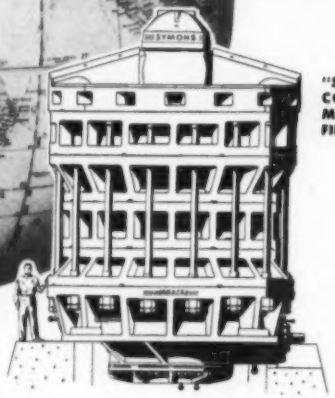

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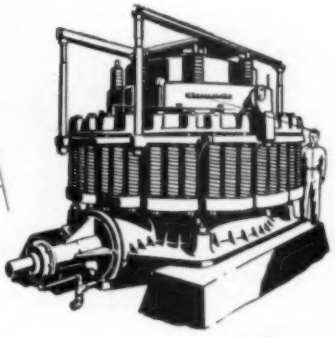

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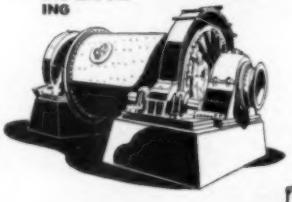

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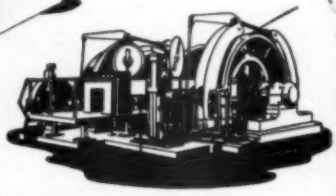

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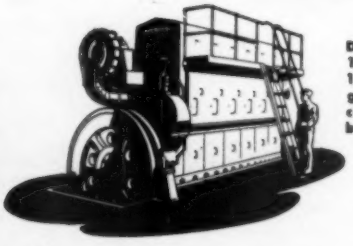

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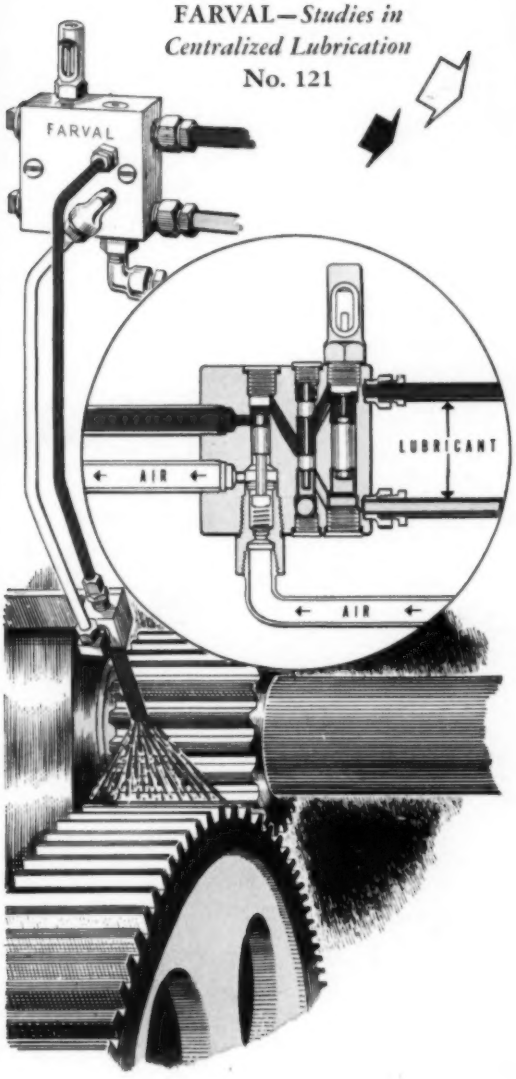

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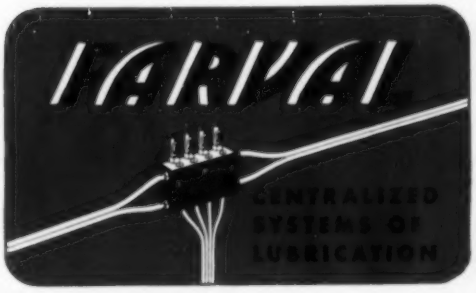

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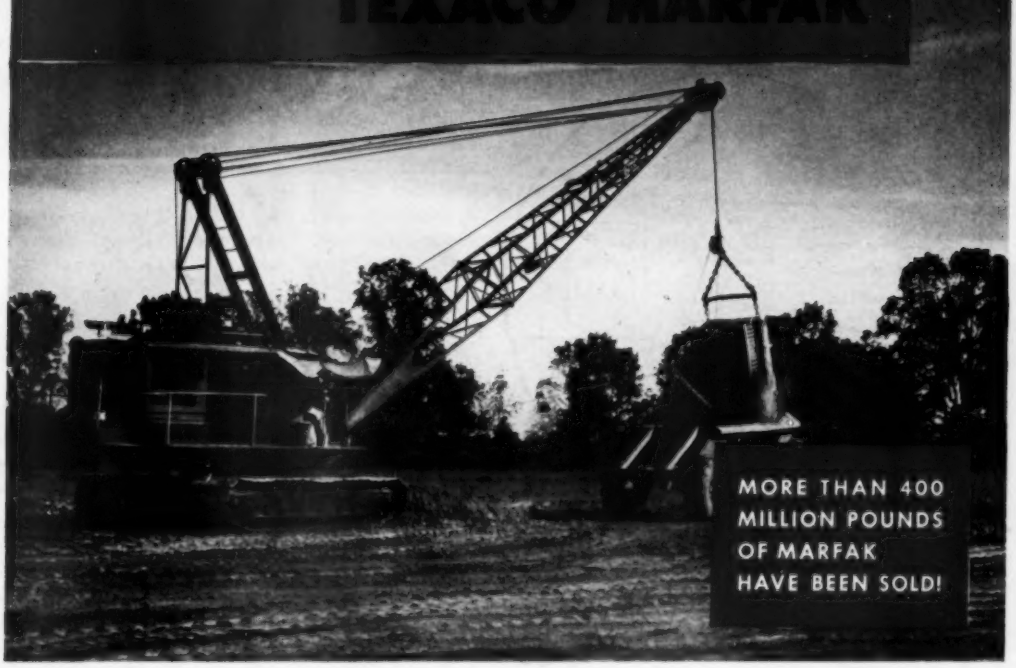

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